

# NEW ZEALAND SETS JAPANESE QUOTA

'Generous' allocations cause disappointment in Tokyo

NEW ZEALAND Prime Minister R. D. Muldoon has announced the fish quotas for Japan following the signing last month of an agreement between the two countries.

These are:

○ 65,000 metric tons of finfish up to March 31 next year (56,000 tons by trawl and 9,000 tons by bottom line).

○ 33,000 tons of squid to August 31. Of this, 29,000 tons may be taken by line and 4,000 tons by trawl.

○ 7,000 tons of bluefin tuna, the 1977 catch.

Immediate reaction from the New Zealand fishing industry was that the quotas were extremely generous, particularly that for only six months of fin fishing.

The squid quota was no surprise. Normally, Japanese trawlers also get 3,000 to 4,000 tons of squid as a by-catch.

The 15,000-ton squid quota for the Soviet Union and 4,000 tons for South Korea have also been announced. The Soviet haul in 1977 was reported to be 26,800 tons caught by trawlers.

The Japanese were reported in Tokyo to be disappointed by the allocations. The Japan Fisheries Agency said they expected much larger quotas and had asked for the same tonnage as they caught in 1977.

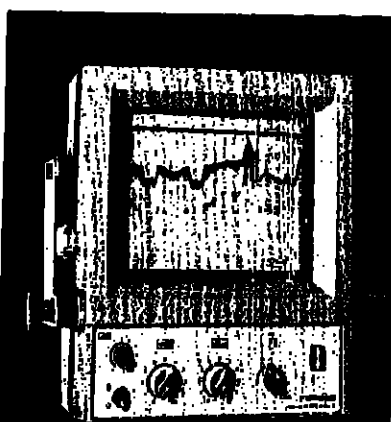
## Stepped up

Commenting, *FNI's* correspondent in New Zealand says it is well known that the Japanese fishing effort was stepped up in recent years in anticipation of a 200-mile zone declaration.

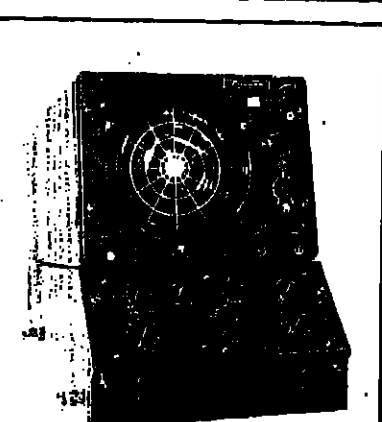
The squid fleet kept the same number of vessels, 128 of them, over several years. A catch of 38,400 tons in 1977-78 reflected a particularly good run.

But the trawling industry had boosted its effort. From 52,276 tons in 1974, the catch rose to 100,446 tons in 1976 and 214,300 tons in 1977.

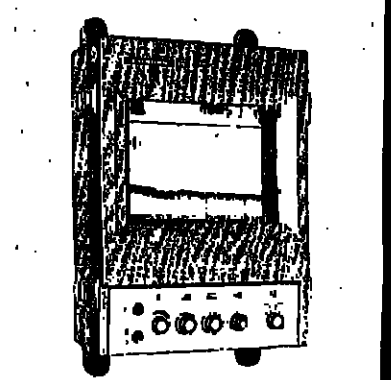
Apparently, the New Zealand administration has made it clear to the Japanese government and industry that allocations made in 1979 and subsequent years will be influenced by the degree of co-operation in improving access to markets in Japan for New Zealand primary products.



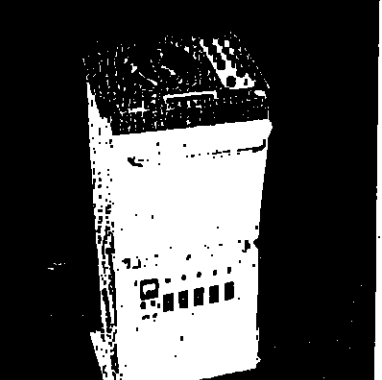
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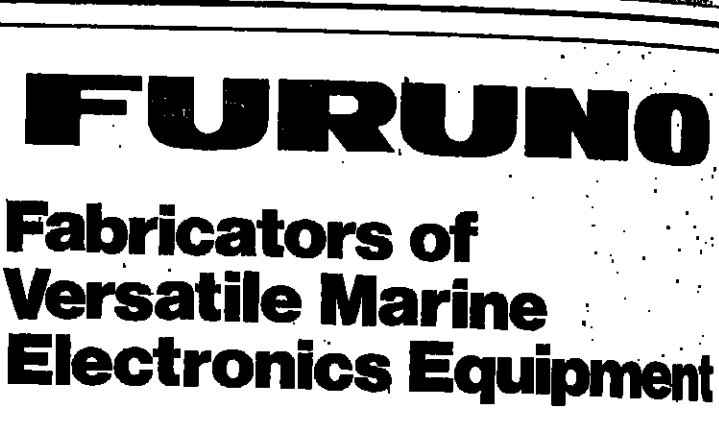
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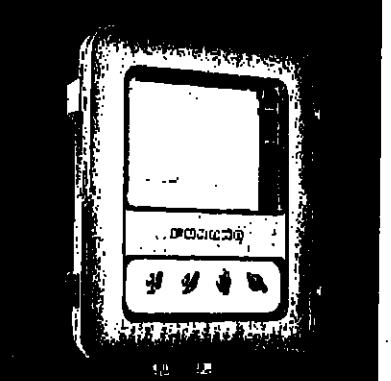
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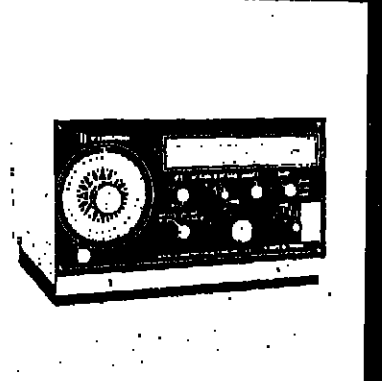
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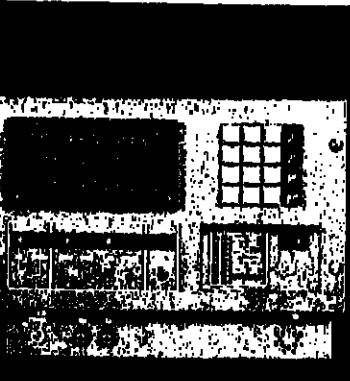
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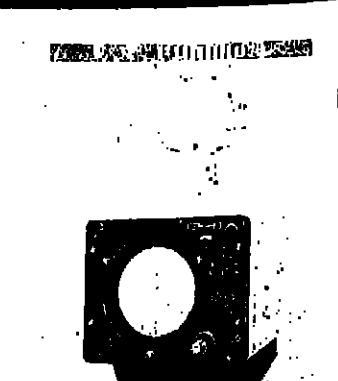
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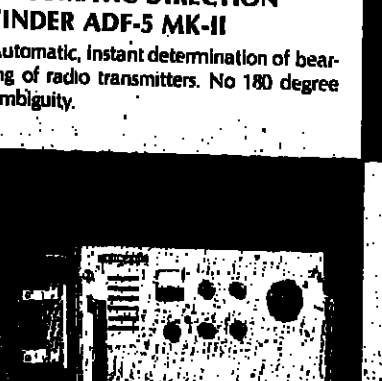
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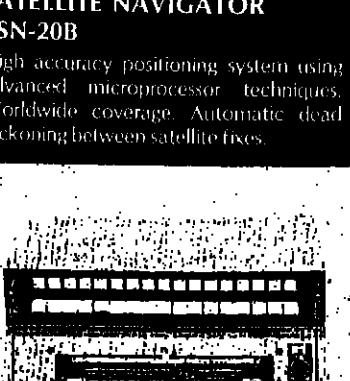
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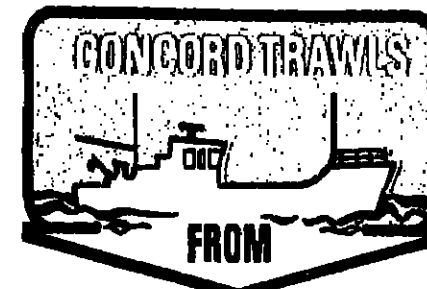


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# fishing news international

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**COSALT**  
GRIMSBY ENGLAND

## Italian ships for mackerel



More buyers for Cornish catches — Page 3

## ARCTIC COD SLUMPS

Barents Sea stocks in bad state — Page 10

## Germany-NZ venture

Supertrawler will fish in deep waters — Page 14

## NOR-FISHING IN OSLO

Two seminars with big exhibition — Page 18

## FISH ISLANDS

The Maldives

Islands off India are dependent on fishing — Page 28

## Iceland



A good year for frozen exports — Page 30

## Shark cages for divers

New device to protect abalone fishermen — Page 44

## Mid-water shrimp trawl

Canadians test a new catching method — Page 47

## BANGLADESH FISHERIES

Promise in substantial marine resources — Page 64

## Comment — 5

From dockside — 7

Boats — 34

Ports Markets — 42

Product news — 51

Books page — 58

# \$50m BOOST FOR U.S. TUNA FLEET

from **WILLIAM C. CAMPBELL**  
in San Diego

## Van Camp orders ten big ships

**VAN CAMP Sea Food** — a division of the giant US food conglomerate, **Ralston Purina** — is enlarging its tuna fleet by ten vessels. The total cost of the order is estimated to be upwards of US \$50 million.

Each of the new superseiners will be in the 220 ft (67 metre) class and each will be capable of carrying 1,200 tons of frozen fish.

Seven vessels are to be built by the **Burton Shipyard** of Port Arthur, Texas, with delivery due to begin next year. The other three have gone to **J. M. Martinac Shipbuilding Corporation** of Tacoma, Washington.

Each ship will carry her own helicopter to extend the hunt for tuna in distant waters.

Meanwhile, the **Marine Division** of **Campbell Industries** in San Diego, has had to cancel a contract to build three seiners for **Van Camp** as part of a retrenchment programme.

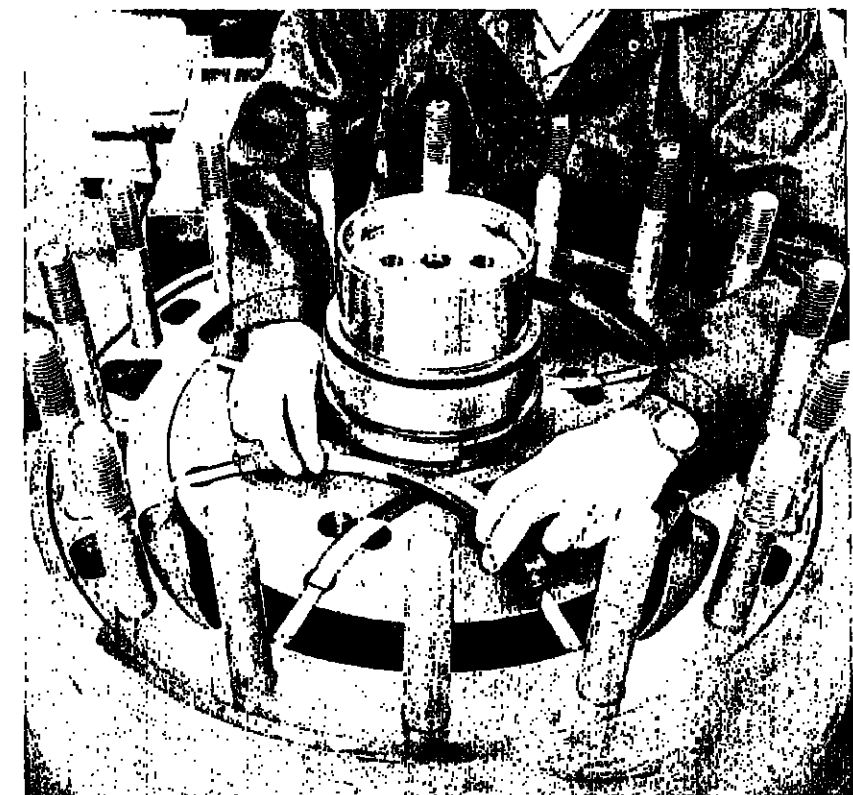
Adding to Campbell's problems, an explosion and fire there injured 13 employees recently and caused an estimated \$50,000 damage to the tuna purse seiner **Princess** under construction for **Star-Kist Sea Food**.

## Freshwater record

**CANADA'S** Freshwater Fish Marketing Corporation has announced a \$4.5 million sale of whitefish to Poland.

This is the largest single order ever received by the Corporation which was formed nine years ago by the provinces of Alberta, Saskatchewan, Manitoba, Ontario and the

Northwest Territories in partnership with the federal government. Corporation chairman, **Peter Moss**, said that provincial fisheries officials will be asked to consider short-term changes in fishing seasons and catch quotas in order to ensure sufficient fish is received to meet the order and to maintain supplies to regular customers.



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# SUPPLY STARVED ITALY TO SEND SHIPS FOR UK MACKEREL

## Trade mission finds Italian market wide open

ITALY is planning to base freezer trawlers off the south-west coast of England this winter to take mackerel caught by British vessels.

Last year, the Tontini concern at Anzio sent a freezer to British waters as a pilot operation. This proved fairly successful and two vessels with a combined processing capacity for 120-tonnes a day will be on the mackerel grounds this season.

With imports from Japan and Korea

becoming difficult through the introduction of 200-mile limits, Italy faces a supply problem. In 1976 Italian fish imports for human consumption were running at 252,400 tonnes and the country had a fish trade gap of £173 m.

The market is wide open for a variety of fish and a British export mission to Italy, last month — organised by the White Fish Authority — found a big demand for its products — especially in frozen form.

The visit revealed an almost insatiable Italian appetite for scampi. There was also a lively interest in mackerel, sole, squid, monkfish and cuttlefish.

## SOVIET LINK-UP FOR SWEDISH FISH FIRM

JOINT Trawlers Ltd., the Swedish-based headquarters of the Joint Trawler Group, has established a joint venture with V/O Sovrybflot, the Soviet

Central Organisation for Administration of Fisheries.

The new company, to be called Scarus Marine Nutrition AB, is 50 per cent owned by Joint Trawlers.

One big surprise for the British exporters was the size of fish being handled in Milan, Genoa and Rome: frozen mackerel at 10 to the kilo, sole down to 3½ in and squid 1½ in in the body would have little chance of finding a buyer in Britain.

A big hazard for the British team in supplying fresh fish to Italy is the long four-day road journey.



"Assunta Tontini Madre" off to process British mackerel.

## Feeding the red fleet

Also on the mackerel scene off the South-west of England this year are big factory ships from Eastern Europe. Here the Fleetwood-based stern trawler *Jacinta* is seen transhipping a catch off the port of Falmouth last month.

## Canada buy-back plan

THE Canadian government is introducing a multi-million dollar programme to buy back more than 1,000 Class A licences for lobster fishing in Nova Scotia and New Brunswick.

It hopes this will reduce the number of fishermen enough to give a better livelihood to those who stay in the industry.

A Class A licence holder who voluntarily

retires his licence will be paid \$2,000 to \$6,000 depending on his performance over the past three years. But there is no compensation for boat and equipment.

A pilot programme on Prince Edward Island resulted in the immediate retirement of 175 of 1,500 licences.

Officials hope some 20 per cent of the 6,900 holders in New Brunswick and Nova Scotia will decide to move out.

Improve  
shipping  
or lose  
markets,  
warn  
exporters

# EEC to put Britain in court

DETERIORATION of shipping services for frozen marine products from the west coast of India to European ports is hampering India's fish exporters.

Representatives of the exporters and European buyers have warned in Bombay that if the government does not act in time to provide efficient shipping services, hard-won European markets will be lost.

There have been complaints that a ship belonging to the state-owned Shipping Corporation of India (SCI) was held in Bombay — an acutely congested port — for 55 days with frozen seafood on board.

The ship, the *Vishva Amber*, reached Marseilles four months after loading. Her frozen cargo was found to be damaged and complaints were received from European buyers.

According to the ship's surveyors, the cargo was delivered to the vessel at temperatures ranging from minus 12 to plus two degrees Centigrade. SCI claims the carrying temperature on the ship was minus 20 degrees throughout the voyage.

THE long-standing row among EEC countries over settling an internal fisheries policy has reached the stage of legal action. Eight member states have decided jointly to take Britain to the European Court over its unilateral action on conservation.

The move is intended to force Britain to lift four measures which include: an extension of the Norway pout restriction; 70 mm net mesh restriction for nephrops; and bans on herring fishing off the Isle of Man and Northern Irish coasts.

One of the few small herring fisheries still open is on the Clyde, in Scotland, and the EEC is trying to force the British Government to close this down.

The main European herring fisheries — in the North Sea and off the west coast of Scotland — are already closed. The EEC is also restless about this situation and

## US order for 16 shrimpers

SAHLMAN Seafoods of Tampa, Florida, is to add 16 new vessels to its shrimp fleet — the largest in the United States. All 16 boats will be powered by Cummins six-cylinder marine diesels.

The vessels are to be built at the newly expanded facilities of Steiner Shipyard, Inc., in Bayou La Batre, Alabama, and the first, the *High Noon* is due for delivery this autumn. The shrimp trawlers will have a length of 75 ft, breadth of 22 ft and midships depth of 11 ft.

Fuel and freshwater capacities will be 18,000 gallons and 2,000 gallons, respectively.

## Norway meal all sold

PRACTICALLY the whole year's production of Norwegian fishmeal and oil has already been sold, according to Carl S. Arnesen, managing director of Norsildmel. But little profit has been made because of a tremendous slide recently in the prices of capelin products.

The problem at the moment is moving the meal and oil before the winter capelin season. Buyers are slow to take out their stocks at this time of the year when contracts can call for deliveries as late as next March.

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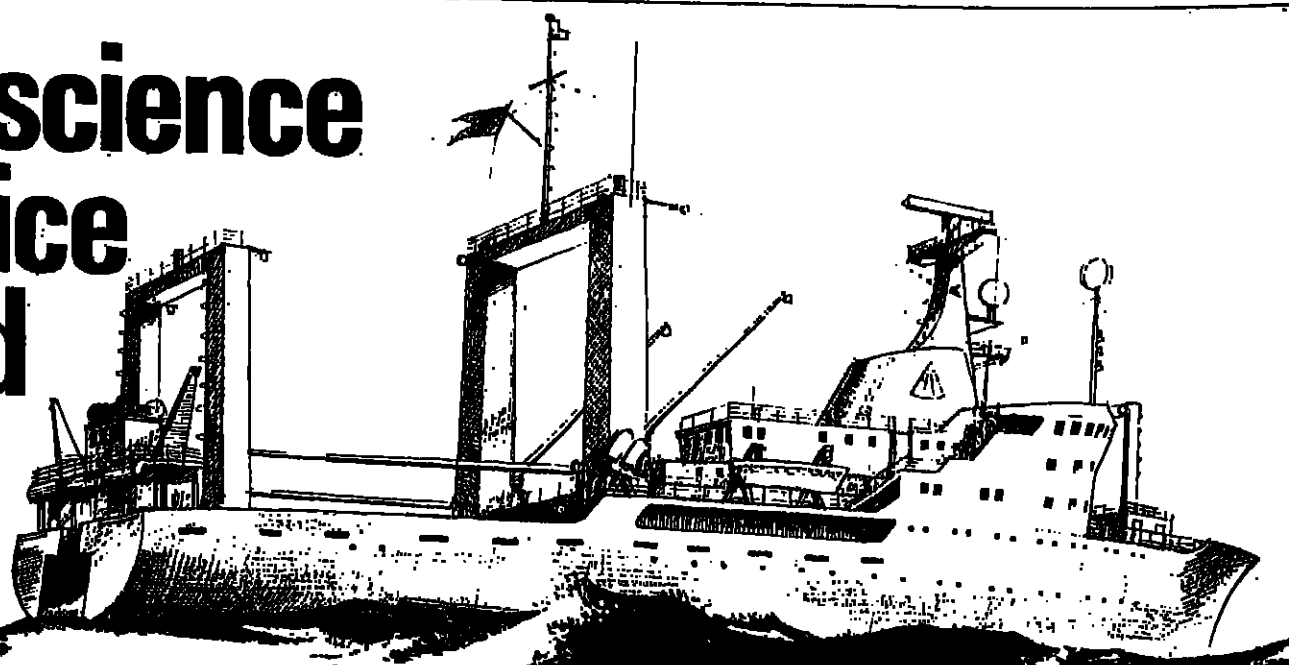
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## British port lifts three year landings ban, and...



Smiling skipper Trygvi Gunnarsson: Glad to be back in Grimsby.

## Iceland comes back with a bang!



The Brettingur: a welcome landing.

ICELAND came back in style to the English east-coast port of Grimsby last month.

Following the lifting of a three-year ban on the offloading of Icelandic trawlers by the Grimsby 'lumpers', the 155 ft (47.3 metre) Brettingur sailed in to earn £66,936

for 258,000 lb of quality wet fish.

This was the first Icelandic landing at the Humberside port since the end of the 'cod war' between the two countries and was easily the best, grossing there by any vessel this year.

The Brettingur's skipper, Trygvi Gunnarsson, was delighted with the outcome.

He told *Fishing News International* that he had been to Grimsby many times before and that he had many friends there.

Skipper Gunnarsson, who has commanded the five-year-old Japanese-built trawler since she was new, said that he made the catch in ten days south-east of 'Kidney Bank.' Until recently, he added, fishing off Iceland had been very slack.

The vessel's turnout included 1,193 kits of cod (1 'kit' at Grimsby equals 140 lb); 383 kits of haddock and 153 kits of cod.

The merchants at Grimsby were also delighted with the landing.

With distant water fishing from the once-famous deep-sea port now a thing of the past, their survival will depend largely on direct exports from foreign vessels.

## FAROESE SAIL IN WITH A RECORD

THE Faroeese were also among the British port record breakers last month.

The 80 ft (24.4 m) stern trawler *Von* broke a class record at Fleetwood on the west coast with 900 kits of cod, cod and haddock, which sold for £34,499. She had been at sea for 14 days.

The *Von* is no stranger to Britain: She was built by the Campbeltown shipyard in Scotland, which has produced several record breaking boats. A desperate shortage of fish at Fleetwood has generated much interest in a link with Faroe.

Richard Cook, president of the Fleetwood Fish Merchants Association, said: "The port urgently needs fish from every possible source, because we do not have enough ships of our own", he said.

## Indonesia 'file'

INDONESIA'S catch in 1977 was estimated at 1.5 million tons, but this is thought to be less than one-fifth of potential production.

Fishing, for export and local consumption, accounts for about two per cent of the country's gross domestic product (GDP).

A recently compiled 'hot file' on Indonesia shows that some fishery products are becoming valuable foreign exchange earners. Shrimp and skipjack tuna, for example, increased in export value from US\$31 million in 1972 to \$31 million in 1976.

## New plant

THE American subsidiary of Frigor in Norway has opened its new processing and distribution centre in New Bedford, Massachusetts.

It spreads over 13 acres on the New Bedford waterfront and includes a 46,000 sq ft production area and cold store that can hold up to ten million lb of product.

This new plant will process cod and other fish from Norway into fish sticks and portions.

## Low shrimp catch

BAHRAIN shrimp catches are still disappointing, four months into the season.

The summer there has been unusually cool and there has been a low rainfall which could have retarded juvenile shrimp growth, said Colin Lee, deputy director of the Bahrain Fishing Company.

## FAO warning

FAO has warned Pakistan that its coastal waters will be completely depleted of shrimp by 1980. The warning is based on the absence of stock preservation methods in the country.

## Philippines aid

THE Norwegian aid organisation, NORAD, has recommended development aid for a trawler fleet for the Philippines, and if approved, the project will consist of eight 123 ft long trawlers and four 45 ft inshore boats. Five of the trawlers will be built by yards in Northern Norway.

## MORE CASH FOR CEY-NOR

NORAD, the Norwegian aid agency, has recommended an additional 2.2 million kroner for the Cey-Nor fisheries project in Sri Lanka. It was originally intended that the project would be transferred entirely to Sri Lanka by 1979. The programme includes the construction of a boatyard, fish processing plants, net factory and a training centre.

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## comment

CANADA'S 200-mile fishing limit has opened up huge new opportunities for her fishing industry. As foreign vessels have either been forced out or obliged to take much reduced catches, local fishermen and processors have moved in.

But the change is more than a simple transfer of effort. To take full advantage of it, the Canadian industry needs the research, the technology and the equipment to exploit once-neglected species, to develop new processing techniques, and to find market outlets.

Some enterprising sections are already doing this. Market promotion is certainly being intensified and work such as that on mid-water trawling of pink shrimp (reported in this issue) should lead to more effective use of stocks.

There is even an attempt to trade-off some Canadian fishing rights for access to foreign markets.

In September, foreign countries working inside the Canadian 200-mile zone were invited to submit proposals for sharing about 100,000 tons of fish surplus to Canadian requirements. But the strong implication was that this would have to be in exchange "for a commitment to buy Canadian fishery products."

## Market obstacles

Explaining the offer (which at least did not offer fish in exchange for outlets for meat or some other commodity), Fisheries Minister Romeo LeBlanc said the Canadian industry was having to overcome a number of impediments to market expansion. He mentioned currency problems and traditional trading relationships.

He might have added that Canadian fish exports do not always come up to the quality standards expected in some of the markets being sought. And that, in an act of unbelievable folly, his federal fishery administration is planning to close down the institutions that are working to solve this problem.

As part of a cut-back in government expenditure, the Technological Laboratories in Halifax and Vancouver are to close at the end of March next year.

These laboratories have a distinguished record in fish research. Their heads, Dr. Graham Bligh in Halifax and Dr. W. E. Ruzzell in Vancouver (together with many of their research staff), have a world-wide reputation which would have convinced importers that Canada does have competent people working to improve fish quality.

Fish product labs around the world work together. In Europe, for example, their heads meet regularly.

With the expansion of the trade in fish, this contact must become increasingly important for countries boosting catches and seeking buyers.

## 'Ottawa lemmings'

One eminent fish researcher in Europe was so astonished at the news of the closures, that he contacted Dr. Bligh for confirmation before he would believe it.

In Canada itself, reactions were instant and highly critical.

"The Ottawa lemmings continue their rush towards self-destruction," wrote editor Henry Frew in the journal *Western Fisheries*. "Instead of taking a cut from the fat, they have chopped away at the lean, productive part of the Fisheries Service."

Minister LeBlanc made a poor choice in his cut-back decision, said the influential Fisheries Council of Canada. It added that the announcement was received in disbelief "not only in Canada but in other countries where Canadian scientists are viewed as world leaders in fisheries science."

The Minister is being urged to reconsider his decision. He is a man with a common sense attitude towards his country's fisheries. But on this occasion he seems to have taken the wrong advice.

It is still not too late to think again, and to do the Canadian industry and fisheries research a service by keeping the laboratories open.

## Canada

## act of folly

## THE TRUTH ABOUT NET HAULING

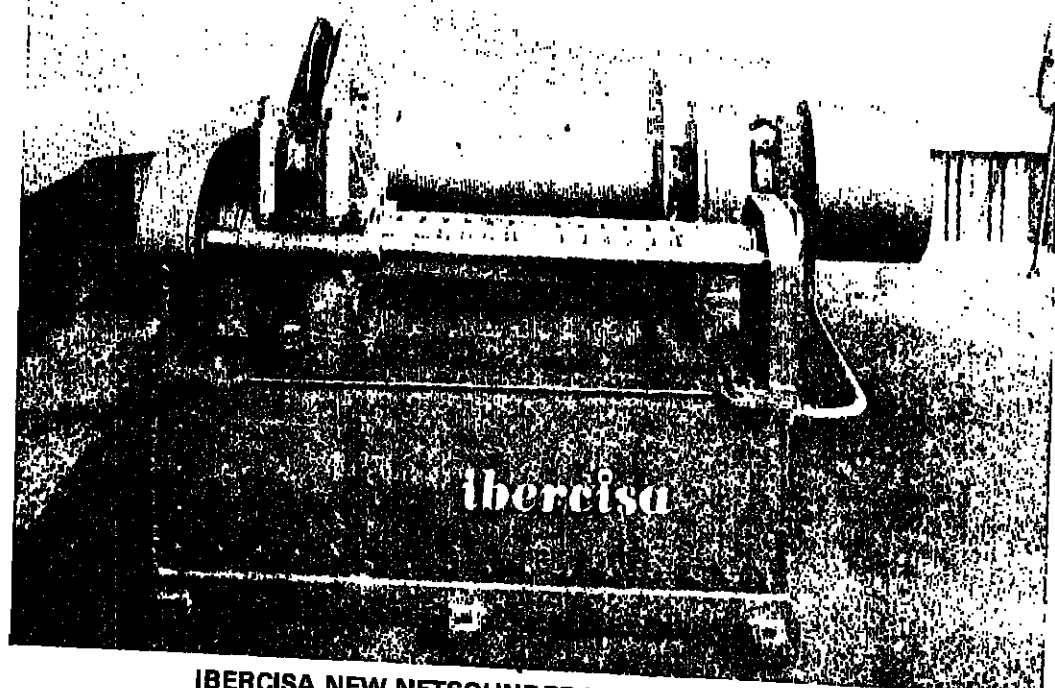


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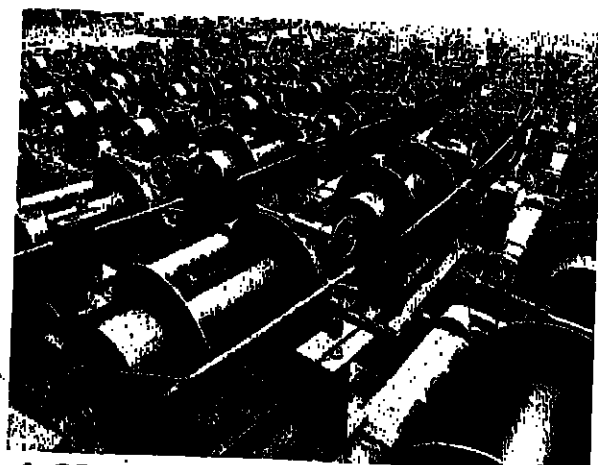
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# Wesmar news

## Gillnetter boosts efficiency with WESMAR sonar

SINCE Steve Arbaugh installed WESMAR scanning sonar aboard his 32-foot (10m) Sierra, he has greatly increased the efficiency of his gillnetting operations.

"I'm used to setting all the time," Captain Arbaugh said, "but with the sonar, I just set when there are salmon."

Because he is no longer dependent on following other fishing vessels to where salmon have been located, Captain Arbaugh also saves wear and tear on the Sierra's gear.

He said that his WESMAR helps him distinguish salmon from less profitable fish, saving him time in his operations. With his extensive experience with the sonar,

Captain Arbaugh has become familiar with the marks different types of fish make on the CRT screen.

"There are differences in the marks," he said. "I watch to see if there are junk fish. Other fishermen just have to guess where the salmon are, or go back to spots where they hit last year."

The WESMAR allows Captain Arbaugh to fish new areas without the worry of damaging the Sierra's gear. "The sonar has kept me from setting in the wrong spots," he said.

When he first reaches the fishing grounds, Captain Arbaugh sets his WESMAR to search for



Captain Steve Arbaugh aboard the SIERRA, equipped with a WESMAR scanning sonar.

nger ranges, scanning around the Sierra until he locates salmon.

"I watch the way the salmon are moving," he said. Captain Arbaugh then continues to track the salmon at shorter ranges until he can make the best set.

With the ability to

determine whether salmon are present in the fishing grounds, Captain Arbaugh does not lose time fishing where it is not profitable.

"Each season is different," he said. "Using the sonar is a much more effective method of finding fish."



Captain William Jeffers, a Gulf Coast shrimp, aboard his SANTA MARIA, equipped with a WESMAR sonar.

## Gulf Coast shrimp protects nets with WESMAR sonar

A FLORIDA Gulf Coast shrimp recommends WESMAR scanning sonar for net protection.

"With the WESMAR sonar," said William Jeffers, who fishes the tricky waters off Apalachicola, Florida in his 65ft. (20m) Santa Maria, "I am able to pick my way through rock piles without worry of hanging my nets."

During one fishing trip, Captain Jeffers and Chris Brannon, another WESMAR user, found themselves dragging the same rocky bottom, neither aware the other was using a WESMAR sonar. Brannon warned Jeffers over the radio about the numerous rock piles in the area, saying the only way he was able to find his way through them was because of his WESMAR. Captain Jeffers replied that he

should have no trouble then since he too was equipped with WESMAR sonar.

Other shrimpers in the area, according to Jeffers, watched in amazement as the two vessels successfully picked their way through the rocky grounds.

Besides using his WESMAR for shrimp, Captain Jeffers uses his sonar in his bottom fishing for grouper and red snapper to locate rocks and other underwater obstructions where the fish congregate.

One incident related by Captain Jeffers was when he was shrimp in the Florida Keys, and spotted a worthwhile school of bottom fish. Putting out his lines, Captain Jeffers brought in 7,000lb (3176 kg) of snapper and grouper in his three-day stay.

## Veteran purse seiner finds success with WESMAR sonar

RALPH COLE, veteran purse seiner from Anacortes, Washington, participating in the recent Washington State roe herring season, installed a WESMAR scanning sonar aboard his Sun Wing II and turned what had until then been an unsuccessful season into a successful one. Cole credits his WESMAR sonar with the success.

On the same day the sonar was installed, Captain Cole and a WESMAR factory representative set out into Bellingham Bay near the Washington-Canada border in search of roe herring. By the end of the day, 16 ton of herring had been caught, and Captain

Cole knew his decision to install the sonar had been the right one.

Cole used his WESMAR sonar to manoeuvre the Sun Wing II and its nets around schools of herring as he watched targets appear on the CRT screen. He had previously been relying on an echo sounder, which restricted him only to "detection" of schools that the Sun Wing II passed directly over.

Cole praised his WESMAR sonar's ability to show the direction and speed of the fish he was pursuing.

"The investment in the WESMAR sonar has really paid off," the satisfied fisherman said.

THE BRUTAL murder last month of six fishermen off Mauritania is a reminder that crews these days face dangers not only from the sea and from the equipment they use.

Mauritania is a poor, sparsely-populated desert country riven by political conflict.

A guerilla movement known as the Polisario has periodically involved innocent fishermen from other countries in its fight against the government.

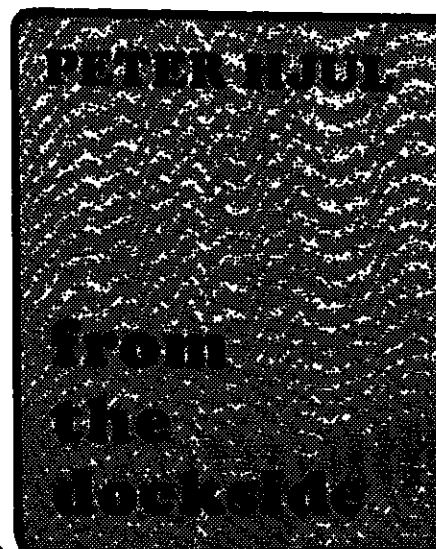
It had until last month concentrated on fishermen from Spain. But, among the fishing fleets working off Mauritania under licence is that serving the fish meal factory ship *l'Interpêche*.

This is as polyglot a collection of nationalities as you could imagine. There are Chileans, Dutch, Spanish, South Africans and many others.

The factory ship was built in Britain for a Norwegian whaling company. She was converted in South Africa, is registered in Bermuda and owned by a company which operates her from Santa Cruz de Tenerife in the Canary Islands.

One of the purse seiners supplying her with sardinella and other species is the 300-ton *Zuidester 8* owned by a Dutch company and registered in Curaçao. Her crew of nine was recruited in Walvis Bay in Namibia.

In the early hours of the morning of Wednesday, October 4, the ship was at anchor off the Mauritanian coast, north of the port of Nouadibou, when she was boarded by a group of armed men later claimed by the Polisario as being members of their organisation.



They kept asking their nationality, apparently refusing to believe the fishermen were not Spanish. Then they shot them, but in the confusion three of the crew escaped by hiding.

Those killed were shot through the head then battered by clubs and gun butts. The dead included the skipper and the mate.

A few hours later, another ship in the fleet, the *Zuidester 3*, came upon the stricken purse seiner and brought her, the survivors and the bodies to Nouadibou.

## Keeping watch

The fleet continues to work off Mauritania but skippers and crews are having to watch out for more than signs of fish. And they are making sure their

boats are kept moving at night well out of range of prowling political thugs.

A more peaceful coast also worked under licence by *l'Interpêche* and her catchers is that of the Republic of Guinea-Bissau, further south.

This former Portuguese colony is one of the very poor countries of Africa with fishing waters among its few natural assets. But, in contrast to most developing countries in the region, Guinea-Bissau is seeking to diversify into rather than out of beach-based canoe fisheries.

I was told this last month when I met her Secretary of State for Fisheries, Joseph Turpin, who had visited Sweden and was completing a tour of British fishing ports, arranged for him by the Foreign and Commonwealth Office.

Rather like Angola, where the Portuguese had developed harbour-based medium-size boat fisheries, Guinea-Bissau has experience of working powered, decked boats well out to sea.

What she needs now said Mr. Turpin are village-based fisheries and small-scale fishermen.

Helping towards this, the Swedish International Development Agency (SIDA) is having ferro-cement pirogues built by a firm in Britain. The craft will be powered by Volvo Penta engines.

Shortly before I met him, he had been talking to the British Ministry of Overseas Development. He invited the Ministry to send a mission to Guinea-Bissau and he hoped this would lead to British participation in his country's important fishing industry.

Soon after being put in charge of

Guinea-Bissau's fisheries early in 1977, Mr. Turpin got a useful introduction to modern technology in the industry when he went to Dakar to see the international fishing exhibition there.

This African Fisheries Exhibition was the British firm Industrial and Trade Fairs' first foray into the industry following its purchase of the World Fishing Exhibition, which it staged later in 1977 in Halifax, Nova Scotia.

## First foray

And this brings me back to the subject of exhibitions. In this column in August, I commented on the confusion among suppliers to the industry caused by a build-up of planned exhibitions and impending clashes in dates. I urged the organisers to get together and try and sort themselves out.

Two have done so, through some linking companies. The French group GERP-SEPIC is going ahead with the exhibition in Nantes in June 1979, but says that its focus will be on the French, southern European and African regions; ITF's World Fishing exhibition, scheduled for Copenhagen in June 1980, will concentrate on northern regions.

I have also had a letter from John Legate, exhibition director of ITF, who says that my comments in August were not really fair to his organisation.

As we have no close involvement, direct or indirect, in any exhibition company, we try hard to be impartial and so I am glad to offer him the chance to say why he believes Copenhagen in 1980 is the right place and time for the next World Fishing exhibition.

## WESMAR is the only way to catch fish

"ONCE you fish with scanning sonar," said Don Dawson, an experienced fisherman who has fished both the Eastern and Western Canadian fisheries, "basically, that's the only way you want to fish."

Dawson, from Vancouver, British Columbia, now fishes the west coast roe herring season aboard his 60ft. (18m) purse seiner B.C. Venture, which he has equipped with a WESMAR scanning sonar.

Pooling with another WESMAR-equipped fishing vessel, the Ocean Cape, Dawson said: "Considering the size of boat we've had, we have always been on the top line."

"There is no problem finding fish or keeping them on the sonar. And, you don't have to be on top of the fish to see them."

This is possible with WESMAR's 360-degree scanning capabilities and long range, making it possible to detect herring schools away from the

vessel and track them continuously while manoeuvring to make the best set.

According to Captain Dawson, his WESMAR is effective in any weather. "WESMAR's sonar works well in rough water because they stabilise the transducer," he said. WESMAR's patented stabilisation system eliminates worry over vessel trim, allowing the sonar to continue to operate effectively even when the vessel's pitch and roll may be up to 25 degrees.

Since Dawson arrived in Western Canada in 1972 to participate in roe herring, his success has not been unheralded. When he first began fishing there, his was one of the only vessels equipped with sonar. In his first season using his WESMAR, Captain Dawson outfished most of the other vessels. Today, over 70 per cent. of the herring roe fleet in Western Canada successfully uses WESMAR scanning sonar.

## Troller recommends WESMAR sonar for all commercial fishermen

JOHN BRUIJIN, owner and captain of the 44ft. (13m) troller Grace Evelyn, considers his WESMAR scanning sonar a major ingredient in his success.

"I am very satisfied with my sonar," Captain Bruijin said. "It has paid for itself many times over."

Fishing for albacore and salmon along the west coast of the United States, Captain Bruijin remembers one incident when his WESMAR meant the difference between success and failure.

According to Bruijin, one night the troller fleet was heading south from

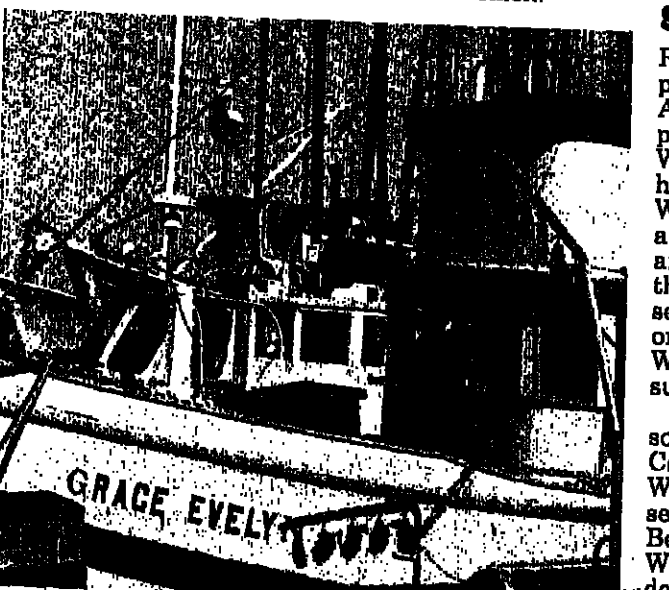
Newport, Oregon, towards Monterey, California. Suddenly the sonar "lit up like a Christmas tree."

Being an experienced sonar operator and familiar with the area, Captain Bruijin believed the marks showed a school of albacore. Along with another fishing vessel he decided to wait in the area until morning while the remainder of the fleet continued towards Monterey.

When morning arrived, Captain Bruijin found himself in the middle of a large school of albacore. He radioed so the rest of the fleet would be notified. They too soon returned to aid in the catch.

Said Captain Bruijin about his experience: "Without the sonar, I would never have seen that school, and would

have continued to Monterey without catching any. I recommend WESMAR for all commercial fishermen."



Captain John Bruijin's successful troller GRACE EVELYN, equipped with WESMAR scanning sonar.

## NORDIC'S EXPORTS MAKE £40m

THE Nordic Group of fish processors in Norway last year exported 41,000 tons of products valued at 418 million kroner (about £40 million). The largest outlets were the United States, Britain, Finland and West Germany.

Nearly 80 per cent of the fish sold to America was in processed packs.

## EEC MISSION SETS OUT TO COURT SENEGALESE

FISHERIES experts from the European Commission left Brussels last month for Dakar to try and speed up preparations for a framework fisheries agreement with Senegal.

The Commission was given a mandate by the EEC Council of Ministers in July 1977 to negotiate agreements with Senegal, Mauritania, Guinea Bissau and Cape Verde but has made little progress.

The EEC is offering financial compensation and aid in developing local fishing industries in return for continued access to African fishing grounds.

The rich waters there could become increasingly attractive to fleets from EEC countries following restrictions on Icelandic, Norwegian, Faroese and other grounds.

But the African countries have been in little hurry to do a deal, possibly because they fear

an invasion by the Community fishing fleet.

The Italian fleet of about 47 vessels (45,000 grt) and a total catch capacity of about 90,000 tons was excluded from West African waters early last year. But the French deep sea tuna fleet of 30 vessels still enjoys certain fishing rights.

The Commission is optimistic that if the Senegalese trip is successful then negotiations can start in Brussels next month.

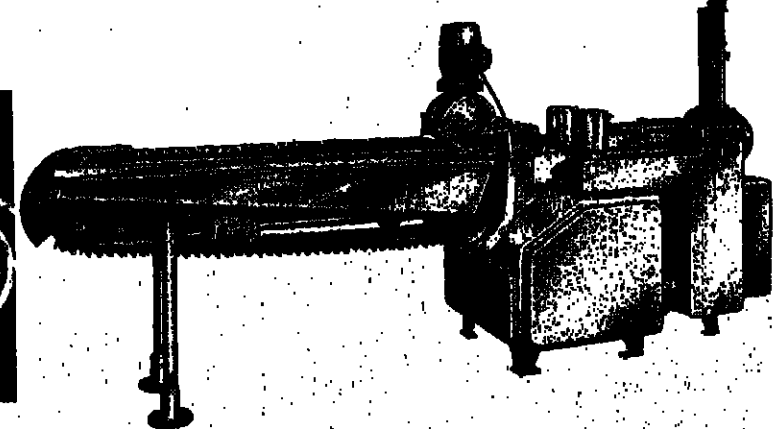


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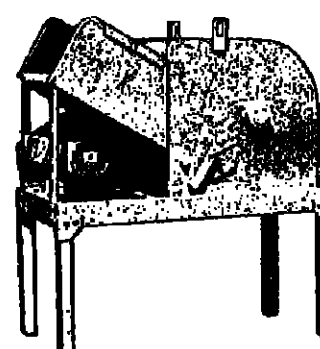


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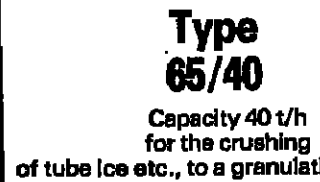
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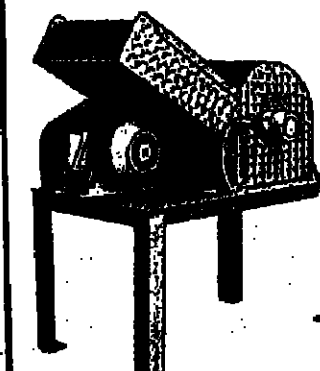
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# Fish firms flock to Monte Carlo

FOUR HUNDRED delegates from 30 nations, representing 183 companies, have registered to attend the first International Seafood Conference in Monte Carlo this month.

Reading like an international Who's Who of fish processing and marketing firms, the lists of participants takes in contingents from the United States, Canada, South and Central America, Scandinavia, Western Europe, Australia and Japan.

According to the sponsors, the massive response reflects the very great need for an international forum for seafood companies.

Set for November 12 to 15, the two and a half day conference will cover supply prospects, future demand, marketing and the outlook

for prices both in the developed and developing nations. There will be a special presentation on an in-

ternationally sponsored seafood promotion campaign and discussions on international co-operation in the seafood business.

Following the conference, a tour has been planned for participants wishing to attend SIAL (International Food Products Exhibitions).

Transport, accommodation and admission to the SIAL exhibitions are included in the special travel package.

A reception has been arranged for November 16 where the Mayor of Paris will greet SIAL guests from the Conference.

**First world  
seafood  
conference  
looks a winner...**

## Four keynote speakers



A. H. Coburn  
Managing Director,  
Findus Ltd., UK.  
How a multiple company views future growth and profits in seafoods.



Dr. Geoffrey Burgess  
Director, Torry Research Station, Aberdeen, Scotland.  
Emerging technology in the fishing industry.

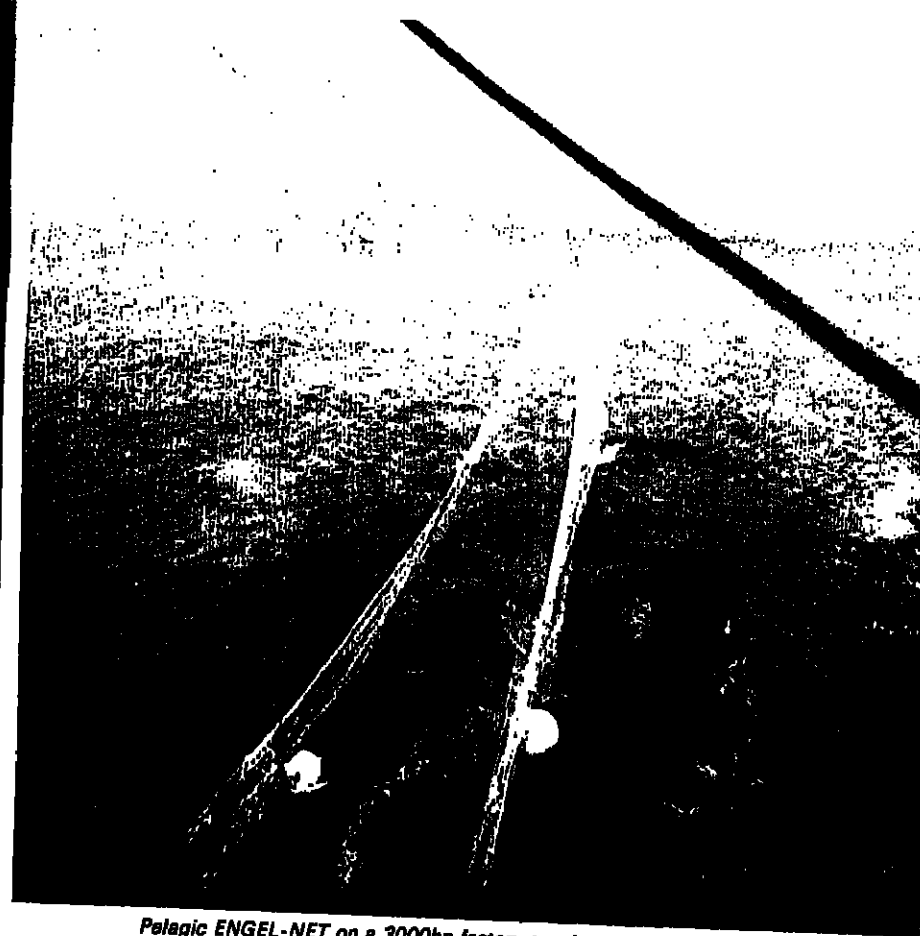


W. P. Appleyard  
Chief, Fishery Industries Development Service, Fishery Industries Division, FAO, Rome.  
Overview of fisheries development plans of emerging nations.



Dr. John Liston  
Director, Institute for Food Science and Technology, College of Fisheries, University of Washington, USA.  
Worldwide health considerations for the seafood industry.

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## Norway fishermen lose fight for oil compensation

AFTER three years of argument, the Norwegian government has announced that it will not be compensating trawling companies for the closure of fishing grounds by the offshore oil industry.

The government contends that cleaning up the seabed eliminates the basis for claims. Trawlermen do not agree.

But after three years of consideration and repeated demands by fishermen, the matter now seems settled, for the North Sea at least.

All the Norwegian fishermen's organisations have said that they want to know exactly where they stand when oil exploration work moves northwards in 1980.

• Fishing is good in the greater Ekofisk oil-producing area in the North Sea, according to the Norwegian Fisheries Directorate.

As in the Gulf of Mexico, the offshore installations attract fish by their light and they help the growth of feed organisms.

## India ports wrangle

FISHING ports now being built along the Indian coast are to come under the Ministry of Agriculture if they are separate from the general cargo ports nearby.

All other harbours will be placed under the port trust concerned.

The Ministry had asked for all fishing ports, but this was opposed by the Shipping Ministry which said this would create administrative problems. Many harbours, for example, have common navigation channels.

# Sometimes you depend on a diesel for more than your living.



Cummins, the world's largest independent manufacturer of diesel engines, know better than anyone that designing and building diesels demands a fine balance of many factors.

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Sophisticated technical design can often give useful extra performance or economy. Yet this must be allied to simplicity of maintenance and servicing. Compactness and ease of installation are also vitally important, but so are strength and durability.

None of these considerations, however, is given precedence over Cummins' single-minded objective: to produce the most reliable diesel engine on the market. This applies to every size of Cummins engine, from 200 right up to 1,060 b.h.p., whether in auxiliary drive or marine propulsion applications.

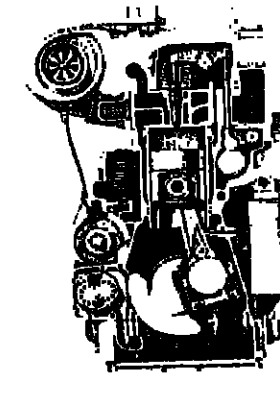
We build every single engine for reliability as if your life depended on it. Because you know that sometime, somewhere, it probably will.



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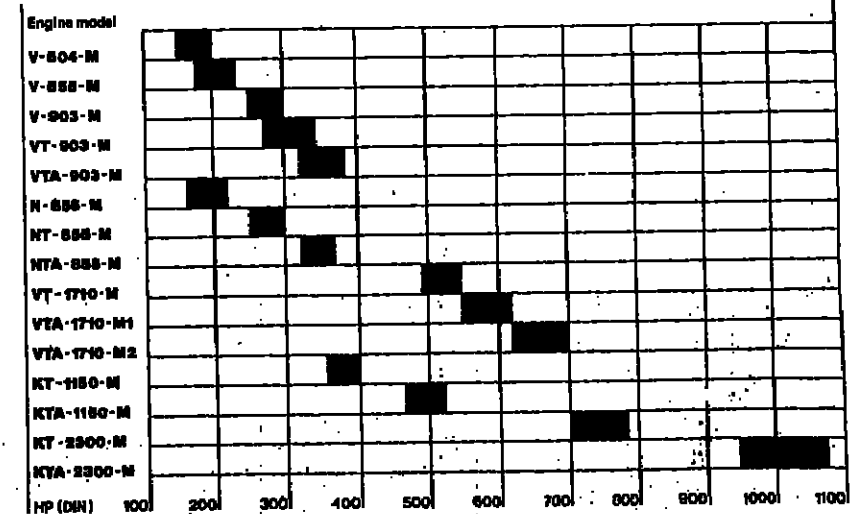


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# BIG SRI LANKA SUBSIDY BOOST

IN A sweeping plan to boost the fishing industry, the government of Sri Lanka is to introduce subsidies of up to 35 per cent on the cost of fishing gear and 50 per cent on engines. And the banks have agreed to loan the balance up to 90 per cent of total cost.

The new measures were announced by Fisheries Minister Festus Perera at the launching in Negombo of the first Sri Lanka fishing vessel equipped with a Dutch Samofa engine.

Mr. Perera told the gathering that, with the new subsidy, fishermen buying boats, nets and engines will have to pay "a very small sum."

The banks, he said, would allow fishermen to repay their loans in small

• 50 per cent  
on engines

• 35 per cent  
on gear

• plus long  
term loans

instalments over a longer period than other credit schemes in operation.

The Minister said that his plan had

received the full approval of President J. R. Jayawardene.

He will shortly be sending out a questionnaire to every fisherman in the country. This will enable the government to get a "fuller understanding of the requirements of the fishing community and solve the problems fishermen had undergone in the past."

Sri Lanka needs 30 million tons of fish a year to be self sufficient, the Minister told FNI correspondent Nalin Wijesekera. "At present the catch only reaches the 16.2 million ton mark."

"With the increased subsidy and credit facilities it would be possible for the country to reach self sufficiency in fish in a year."

## ARCTIC COD STOCK LOWEST EVER!

THE STOCK of Arctic cod in the Barents Sea is in a worse state than had been thought, says Arvid Høyen of the Institute of Marine Research in Norway.

Results of the latest assessments made in August show that scientists under-estimated the impact of overfishing that occurred in 1976 and 1977 and could happen again.

The Arctic cod stock has never before been at such a low level.

The spawning stock, say the Norwegians, is one-third of healthy size and, at 350,000 tons, is 150,000 tons under the previous estimate.

### Negative

The Norwegians will continue efforts to get the minimum mesh size raised to 135 mm.

Soviet response to this initiative has so far been negative.

Høyen says the larger mesh will mean an immediate loss to catches. This could be rectified in three or four years but it will take 10 to 12 years to achieve proper year-class balance of the stock.

### Baltic herring quota cut

THE TOTAL quota for the Baltic herring fishery for 1979 has been fixed at 450,000 tons — almost 40,000 less than this year.

Finland and Sweden have a joint herring quota of 78,000 tons for the Gulf of Bothnia and for the waters south of Anland. How this amount will be divided is to be agreed later.

In addition, Finland can catch 15,000 tons of herring in other areas.

The total catch of sprats for the whole of the Baltic next year is 161,000 tons — again smaller than this year. Finland's share is more than 19,000 tons.

The total cod catch is to be increased slightly to 175,000 tons, compared with 173,000 this year, but agreement has not been reached on its division.

The quotas were decided on at a meeting of the Baltic Fishing Commission in Warsaw.

### GRP TUNA BOAT

THE USTKA yard in Poland has developed a GRP hull tuna fishing boat for operation with a mother ship. The vessel has a range of about 100 miles.

Some of the boats will be supplied to the Soviet fleet. The first two are reported to have undergone trials by the end of 1980, more than 30 will have been built.

## BOATS RUN FROM THE 'PLAYFUL' DOLPHINS

Israeli fishermen in strife-torn Sinai are being chased from their grounds, but not by the Egyptians. The aggressors are huge schools of dolphins.

It's like the eleventh plague of Egypt, say the fishermen. The dolphins have been wreaking havoc with their trawls, despite the protective netting used.

The attacks are having a serious effect on valuable shrimp landings as boats are forced north into less productive waters.

Apparently the dolphins are quite impartial, attacking Egyptian nets with equal relish. The Egyptians have also abandoned the area for the time being.



### Easy on the cod end

BY USING a steel bin, the crews of the Swedish pair trawlers *Penland* and *Santos* have found it much easier to empty the cod end.

Previously, this work required four to five men; it can now be done with two. And the work is not as dangerous as it was.

Made of steel or light metal, the bin holds up to 2.5 tons. It is 1.10 metres over the deck and has three small doors.

## 'PLAYFUL' DOLPHINS

### Norway mission to Japan

TWENTY-FIVE exporters of fish and fish products left Norway on October 24 for a ten-day trade visit to Japan.

Their aim was twofold — to learn all they could about Japanese tastes in fish and to present a selection of their products.

Japan could become a very

important export outlet for Norwegian fish, said Per Hougen of the Export Council of Norway and leader of the group.

Among those making the trip were representatives of Norway's fast-growing fish farm industry and the manager of the SAS freight department who wants to find out how fish can best be transported to Japan.

## Seafood time in Canada

NOVEMBER is Fish and Seafood Month in Canada. Major promotional campaigns will urge people to put more fish on their dinner tables.

Although the fishing industry is of growing importance to Canada, Canadians are not heavy fish eaters. Consumption in recent years has averaged only about 16 lb per capita.

The federal government wants to boost this to 35 lb, reports FNI correspondent Alex Binkley. While still well behind that of the big fish eating countries of Europe and Asia, this would be a huge jump and a boon to the expanding fishery industries.

Nearly 500,000 dollars is being spent on advertising fish to assist the campaign.

Recipe books have been printed and the Health Department is giving more attention to fish in the Canada Food Guide.

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BELGIUM: Antwerp Marine Radio Company N.V. 2000 Antwerp. Phone: 0311 33786, 33892, 310467.

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KENYA: Marina Electric & Gyrocompass Engineers, Mombasa. Phone: 21644. After hours: 71228-20890.

MALTA: Medcomms Ltd., Gzira. Phone: 38521.

MOROCCO: S.C.R.M. Departement Radio Maritime, Casablanca. Phone: 662-52 & 712-57.

NORWAY: Taseg A/S, 1384 Gjetun. Phone: (02) 631190.

PORTUGAL: Mendes De Almeida S.A.R.L., Lisboa. Phone: 867794-867710-867798.

SINGAPORE: Radio-Holland B.V. Hagermeijer Anness Block 900 Dunsen Rd., 11 km. P.O. Box 4050 Bukit Timah. Singapore 21. Phone: 67144.

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TUNISIA: Compagnie Tunisienne d'Electronique, Tunis. Phone: 283988-283407-283972.

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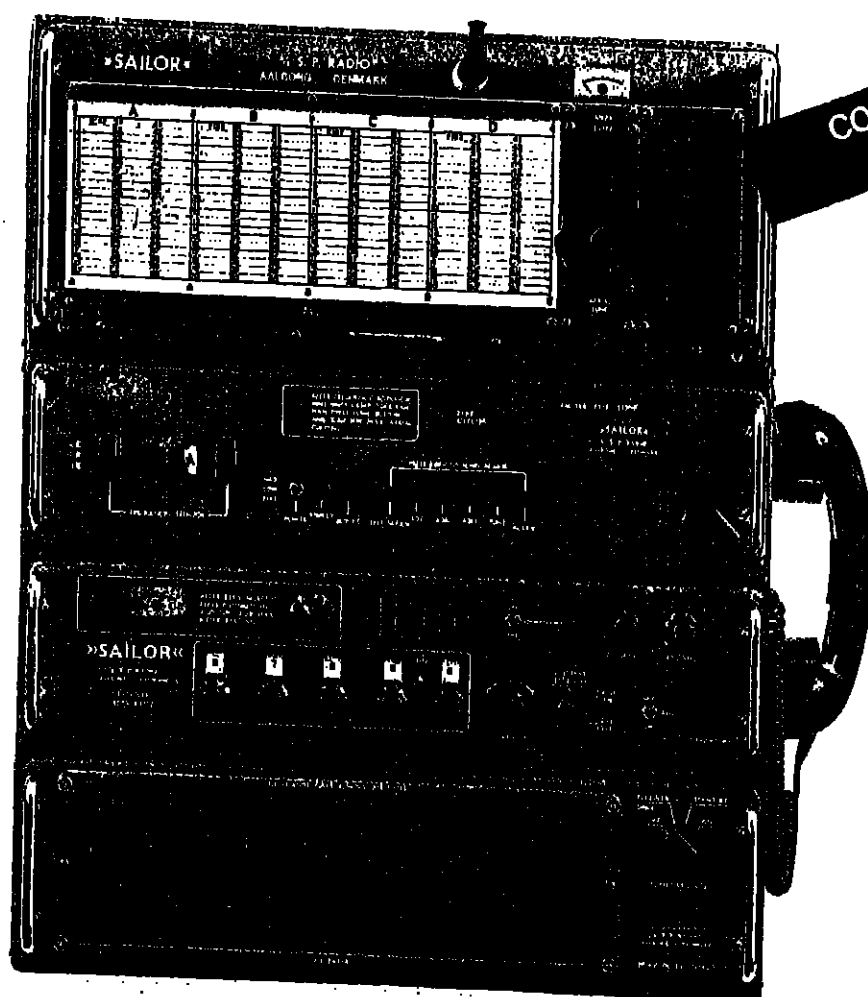
UNITED ARAB EMIRATES: Elcom International, P.O. Box 1788, Dubai. Phone: 32335.

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## new Sailor SSB short-wave radiotelephone 800 watt output 1,6-27,5 MHz



COMPETITIVE PRICE

### Transmitter and Receiver are fully synthesized

By virtue of the construction of this set (patent pending), it has been possible to keep the number of components in the set to a low level, this implies resulting in high reliability and low price. Another item contributing to the competitive price is the highly developed production methods of S.P. RADIO A/S.

The company runs the largest factory in Europe for the production of Marine Radiotelephone sets, both 1.6 - 4.2 MHz and VHF. More than 90% is exported to about 60 countries.

Dimensions: Height 815 mm  
Depth 430 mm  
Width 495 mm  
Power Supply: 24 Volt DC and/or 110/220 Volt AC.  
SAILOR radiotelephone sets are installed in more than 12,000 vessels every year.

### Simple Operation

For both transmitter and receiver: select frequency, tune aerial, that is all.

### Large Number of Channels - Easy Programming

The transmitter can be programmed for 240 transmitting frequencies in total, these being selected without limitation in the Maritime Bands from 1.6 to 28.6 MHz. The programming of frequencies in the transmitter can be performed within a few minutes using the instruction manual and the programming tool provided.

### Larger Range Covered

The SAILOR SSB short-wave radiotelephone set has an output of 800 watts into the aerial. With difficult installations, where there is some distance between the set and the aerial, the transmitter section can be placed close to the base of the aerial, and remote controlled using SAILOR 11200 at the set. In this way, loss of output (frequently more than 75%) in the feeder will be avoided. All the 800 watts will go into the aerial. The transmitter can be located up to 200 m away from the rest of the set.

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## KVÄRNER

### Self-contained Plate Freezer Unit (KBHU)

The KBHU is a self-contained freezer unit consisting of plate freezer, insulated cabinet, condensing unit and hydraulics, fully assembled at works and ready for operation as soon as connected to electricity and water supplies.

The freezer plates are manufactured from solid blocks of seawater resistant aluminium alloy in which are drilled passages for refrigerant circulation. The combination of a well designed circulation system and the favourable thermal conductivity of aluminium ensures short freezing time and maximum through-put.

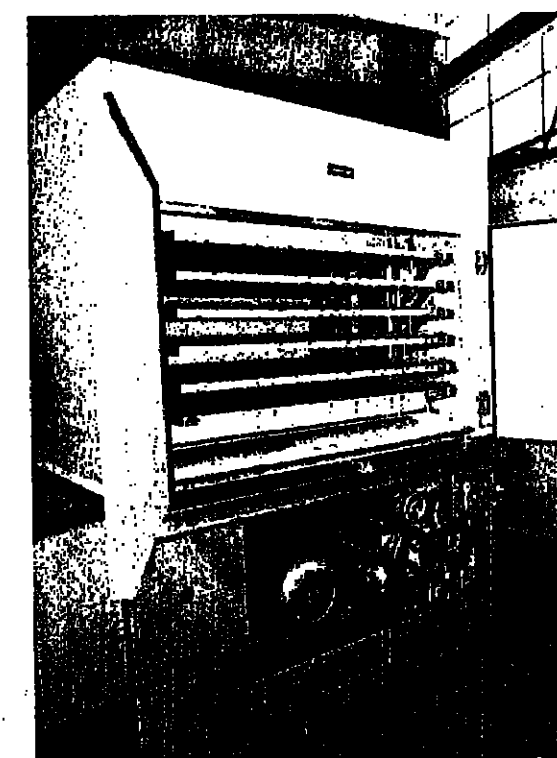
The freezer operates with thermostatic expansion valves on R22 or R502.

Three standard types with nominal output 700, 2000 and 3200 kgs/24h, motor power 4, 11 and 14, 7 kW.

Plate dimensions 1120 x 1320 x 32mm.

Standard plate distances are maximum 25mm, but other combinations may be arranged.

All units are delivered with water cooled condenser, but the smallest type may be furnished with an air cooled condenser.



## New shrimp exporter

THE PORT of Kakinada on the Indian east coast entered the shrimp trade recently when it shipped out nearly 370 cartons in the Singapore-registered carrier *Kota Raja*. Packed by Fish Products Ltd., the shrimp was consigned to a firm in Yokohama, Japan.

Kakinada is one of the minor Indian ports and cargo leaves there by barges which take it to waiting ships four miles away in Kakinada Bay.

The port operates five self-propelled 250-ton barges which were brought into service last year and can carry liquid and solid cargoes.

When the shrimp was shipped, it went first into two insulated trucks. These were driven onto a barge and carried to the ship which loaded the cartons by crane into its refrigerated compartments.

Until this consignment, Kakinada had to send its frozen shrimp out of other Indian ports.

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## DUTCH AID FOR SRI LANKA

DISCUSSIONS between Sri Lanka and the Netherlands are expected to result in a Dutch aid project for the development of the fishing industry along 200 km of the east coast of Sri Lanka, from Trincomalee to Panama.

FNI correspondent Nalin Wijesekera reports that the Dutch government has allocated the equivalent of Rs5 million (about £170,000) for boats, nets and other types of gear, and for training.

## BOSSSES MEET THE UNIONS

US TUNA boat owners and unions came face to face recently aboard the purse seiner *Maria C.J.*

But the bosses, in the form of Manuel Silva, president of the American Tunaboat Owners Association, and the unions, represented by Jack Tarrantino, president of the Fishermen's Union, met in the tuna seining demonstration.

### But it's all friends together for tuna seining demonstration

Union of America (Pacific and Caribbean Area), were on the best of terms. They said there were no problems between fishermen and owners.

Tuna fishermen in the United States have no fixed hourly or weekly rates of pay or contracts calling for regular pay increases. But as long as the price of fish keeps rising, their pay rises with it. Each crewman hired bargains with the skipper for his share.

New men are usually taken on at less than a full share of the catch, but in general all achieve maximum pay in four or five trips — a little over a year

in the normal course of things. The unions become involved only in the event of a dispute, so there was little for Manuel Silva and Jack Tarrantino to argue about when they set sail aboard the *Maria C.J.*

The purpose of the trip was to demonstrate modern tuna seining technology to leading administrators from the National Oceanic and Atmospheric Administration and National Marine Fisheries Service.

They were also shown procedures for saving porpoises that often became entangled in the net.

## Atlantic salmon—crisis meeting in New Brunswick

THERE IS growing concern over the state of Atlantic salmon stocks on Canada's east coast.

Commercial salmon fishing was banned in many parts of Quebec and the Atlantic provinces in 1972 because dwindling stocks needed a reprieve from heavy fishing.

The ban was to have ended this year but Fisheries Minister Romeo LeBlanc ordered that it be maintained until at least 1979 because of poor recruitment.

Because of the crisis a two-day seminar, called for by federal fisheries officials, is to be held this month at Moncton, New Brunswick.

The seminar will study the report of a special task force on the Atlantic salmon commissioned earlier this year.

Fishermen, processors, scientists, economists and provincial experts are expected to attend.

The main problem is in New Brunswick where heavy

pouching and a dispute over fishing rights has crippled federal efforts to build up the stocks.

There are special telephone numbers for people to call police and fisheries officials if they spot pouching, but the problem persists.

● Fisheries Minister Romeo LeBlanc has promised long-term plans for restoring depleted stocks of Atlantic salmon, writes FNI correspondent Alex Blakely.

LeBlanc said that Canada has made good progress in rebuilding salmon stocks on the Pacific Coast and the same can be done on the East Coast.

A key step is gaining effective control over high sea catches of migrating Atlantic salmon, LeBlanc said.

A treaty with Denmark limiting catches off Greenland expires next year and should be replaced with multilateral controls over salmon fishing outside 200-mile limits.

Nothing less than a united international approach will help the salmon.

## FIRST ROE BANK

WORK HAS started on the world's first fish roe bank, at Sundalsøra in Norway, and the first 'depositor' agreements have already been concluded.

The main object of the roe bank is to preserve salmon strains from rivers where they are threatened with extinction. It will also supply roe for breeding.

Breeding material held there during the first year of operation will represent between 15 and 20 rivers, but ultimately this will rise to 60 to 70 rivers.

The majority of 'depositors' are expected to be river owner co-operatives. Invitations to participate have already been issued, and there appears to be considerable interest in the project.



IN CLOSE harmony: Manuel Silva, president of American Tunaboat Owners Association (left) and Jack Tarrantino, president of Fishermen's Union of America, Pacific and Caribbean Area (centre) with skipper Joe Jorge of the tuna seiner *Maria C.J.*

## Four good reasons for hexagon mesh

A HEXAGON-MESH net, built according to a theory developed by a Russian scientist, fishes better than the usual rectangular mesh net. This is the conclusion of Steiner Olsen, head

of Norway's Fishery Technology Research Institute, after a year of tests.

The tests included trials in a commercial fishery off the coast of Finnmark.

The new net has the following advantages:

- It can be set and hauled-in faster because the hexagonal meshes do not fold and therefore offer less resistance in the water. This feature is especially beneficial in strong currents.
- When it is set, the net sinks faster.
- When it is hauled the meshes do not close and entangle the fish.
- It takes 25 per cent less material to make a net with hexagonal mesh. This could mean a saving in Norway alone of some 15 million kroner.

### Lance pulled out

THE *Lance*, which cost 33.3 million kroner to build and has been described as Norway's most expensive fishing vessel, has had technical problems since she was completed last summer.

The Tromsø newspaper *Nordlys* reports that, after trying prawn trawling in the Barents Sea in August, she joined the summer capelin fishery. But she had to pull out after catching about 800 tons.

## Inland fisheries group formed

THE FIRST meeting of the newly-established Commission for Inland Fisheries of Latin America is scheduled to take place in Argentina next month.

About half of the 27 countries of the region have already joined the Commission.

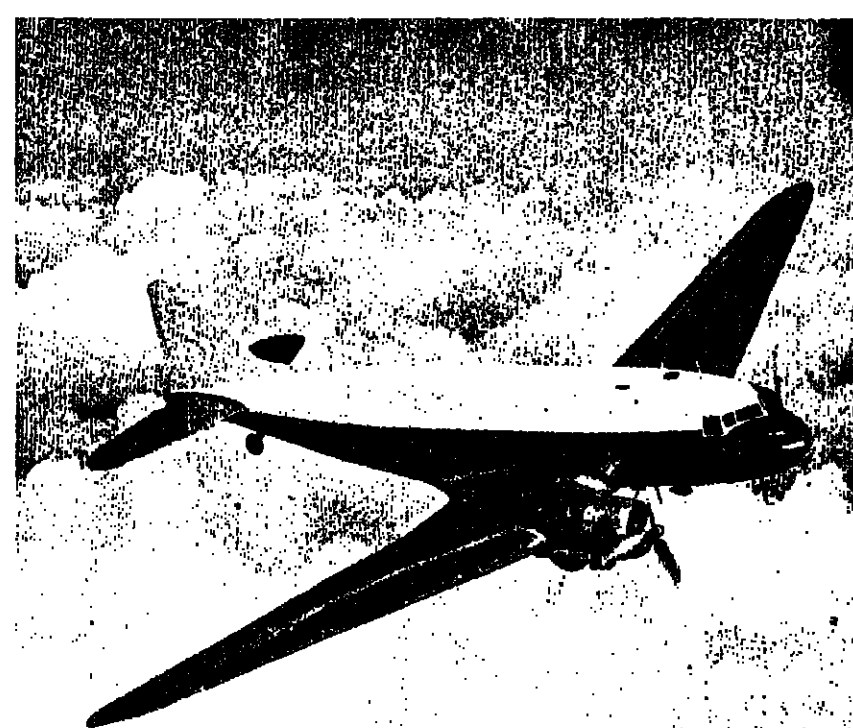
It has been established by FAO in consultation with governments of all member states in the region.

The Commission is intended to promote national and regional fishery surveys and research, assist governments to establish regulatory and other measures relative to inland fishery resources, and assist the development of aquaculture and stock improvement.

It will also promote the use of the most effective craft, gear and techniques in processing, preservation and marketing of fish and fish products.

The Commission will be concerned with education and training of aquaculture workers at all levels and in holding seminars, study tours and training centres.

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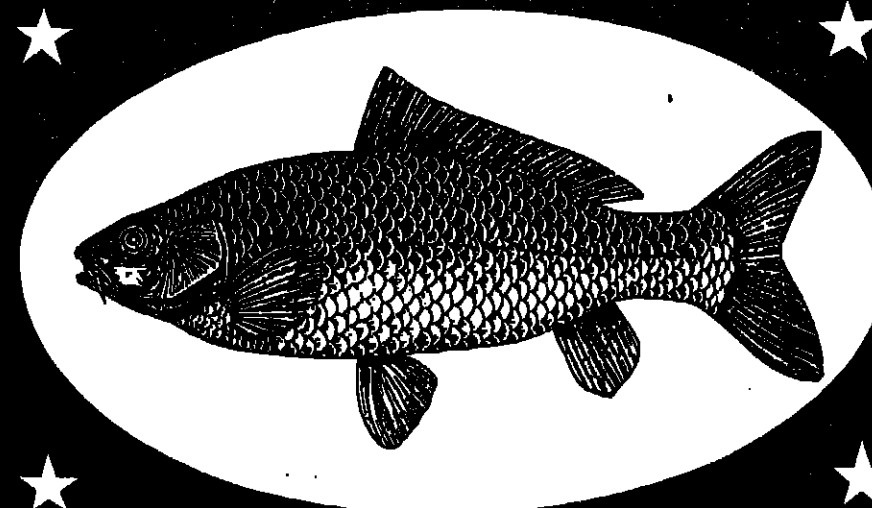
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water is immediately drained thus avoiding any contagious infecting of the fish.

2. There are no stagnant quantities of water liable to be slopped over by the motions of the ship.

3. In actual practice the cross current washing principle represents an individual washing of each fish due to its being rolled over and thoroughly jet sprayed from all sides.

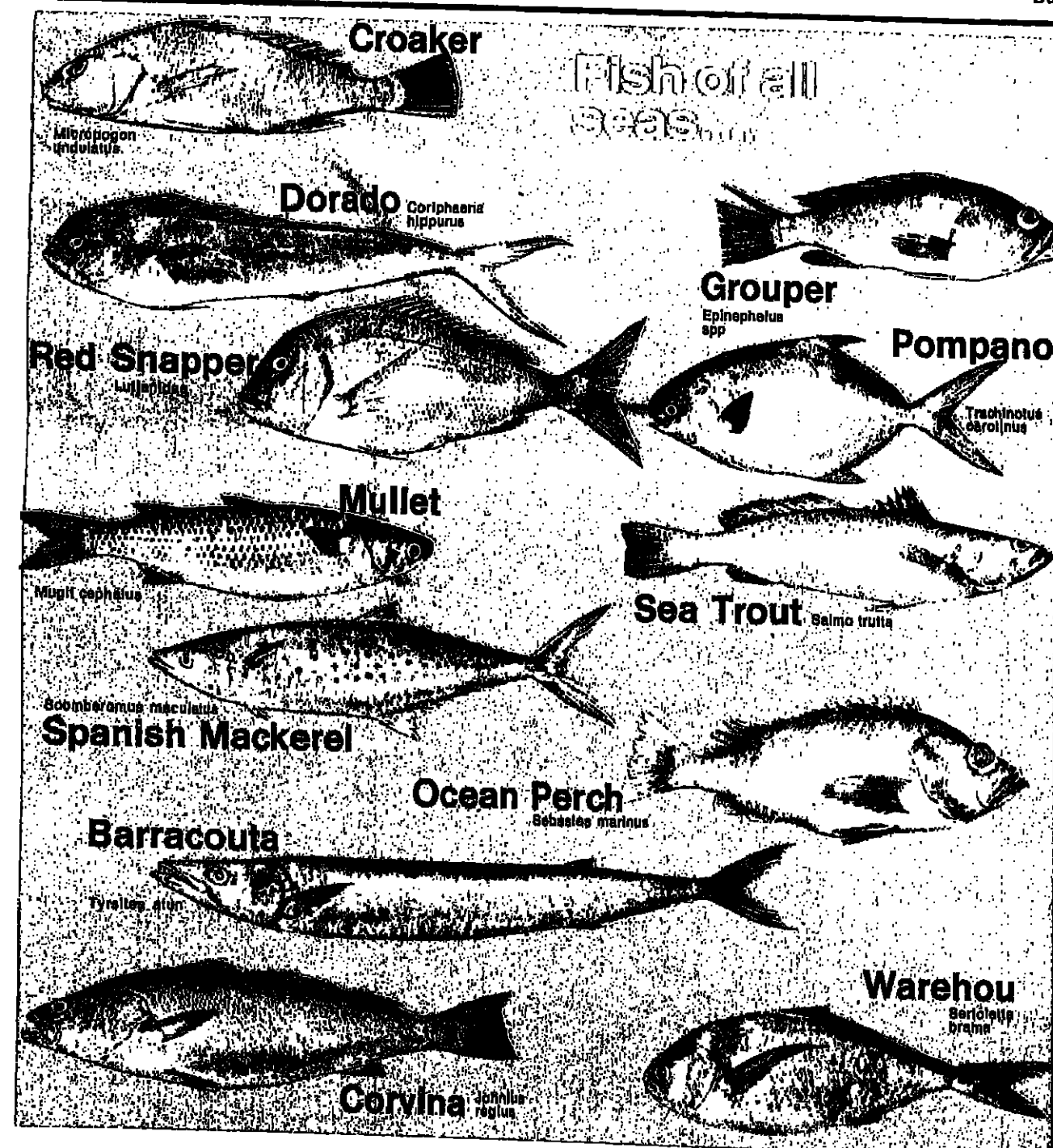
More than 200 fishing vessels of the international fleet have been equipped with WACO fish handling systems.

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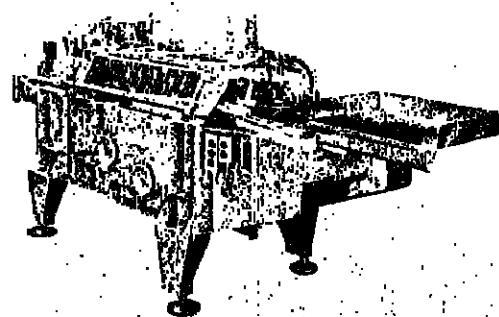


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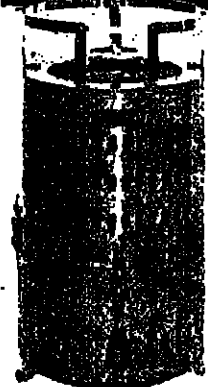
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## New opportunities for investment southern fishery

### German supership sets off to probe the deep

THE New Zealand government has approved a joint venture involving two local companies and one of the leading fishing firms in West Germany.

R. C. Macdonald Ltd. and Southland Frozen Meat Company Ltd. have been negotiating over some 18 months with Hunsentische Hochseefischerei of Bremerhaven.

They have now agreed on a one-year exploratory and experimental fishing phase using the modern West German factory stern trawler *Wesermunde* — a ship of 3,244 gross tons and 95 metres long.

One of the new-generation German factory trawlers built in the early 1970s, the *Wesermunde* will fish around the Campbell Plateau in the extreme south of New Zealand, the Challenge Plateau on the western entrance to Cook Strait and the Chatham Rise on the east coast of South Island.

She will be able to trawl down to 1,200 metres and should take species not usually caught by New Zealand's inshore fishing fleet.

Most of the commercial fishing in deep and distant waters round New Zealand has been by the Russians, although Japanese ships have carried out research trips on a limited scale.

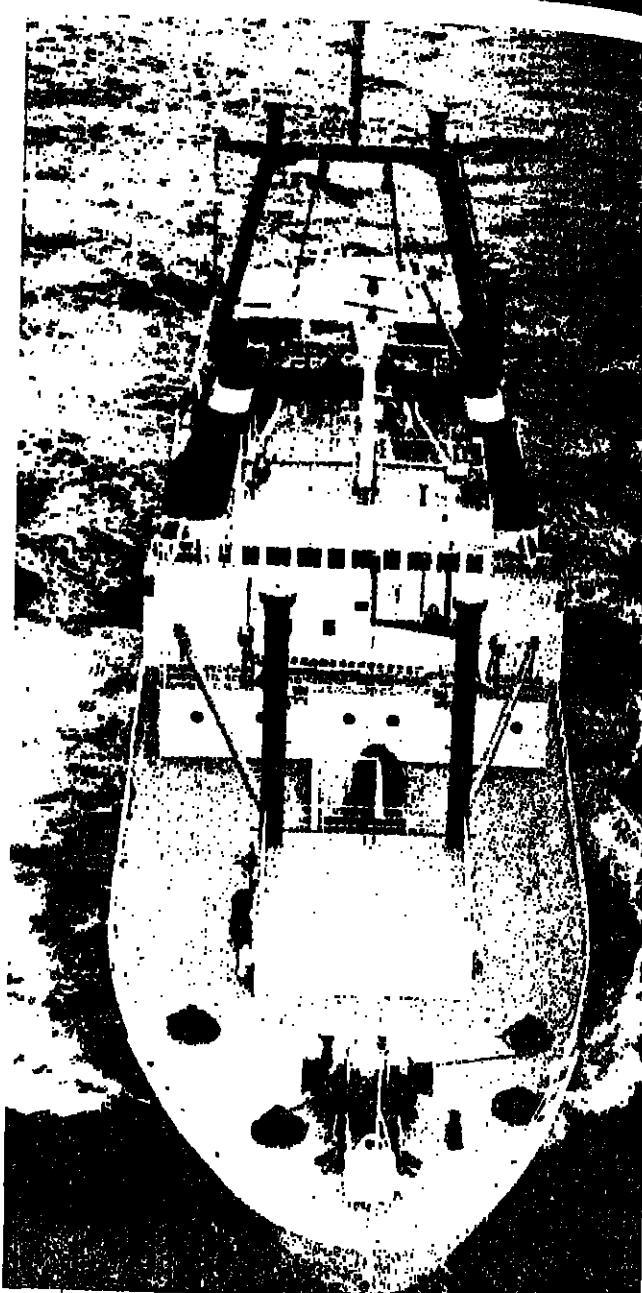
It is expected that about half the

*Wesermunde's* time will be taken up by research under German and New Zealand scientists. The work will extend from resource studies to the fish itself and for machine processing and marketing.

Main species expected to come up in the nets of the *Wesermunde* should include the New Zealand hoki (*Macrurus novae zelandiae*), southern blue whiting (*Macrormestus australis*) and squid.

Her base port will be at Bluff on the southern tip of the east coast of South Island, some 250 miles from the Campbell and Auckland Islands.

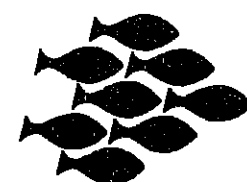
Representatives of the German company were in New Zealand last month finalising arrangements for a venture hailed as a major forward step towards commercial fishing into deep waters from home bases.



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# NZ AGREES TO TEN JOINT VENTURES

TEN joint ventures with foreign companies were approved early last month by New Zealand's Minister of Fisheries, Mr. J. B. Bolger.

All of them have a significant interest in squid.

Other joint ventures are up for government consideration, but the ten were given priority because of the closeness of the squid season which begins in November or early December.

Fifty-one squid vessels are included in the approvals. Of these, 37 are from Japan and the rest from South Korea. They are expected to take nearly 17,000 tons by jigging.

Four trawlers are also included in the ventures and they should catch 4,250 tons plus about 10,000 tons of less preferred fin fish species.

Mr. Bolger said that

**Others pending, but squid catchers given the top priority**

the joint venture companies would be about \$12 million. But he emphasised that export returns did not mean profits.

Several of the New Zealand companies are new to fishing. They have taken this opportunity to diversify.

Fishing companies who have links up with the foreign operators see this as a chance to learn as much as they can about squid catching, preservation and marketing.

During the 1977/78 season, about 93,700 tons of squid were landed and only 500 tons of this by New Zealand vessels.

Countries allowed squid and other fish quotas will have to pay licence fees based on the amount caught. If she catches her full allocation, Japan will have to pay \$5.5 million; Russia \$2.9 million and South Korea \$1 million.

the total gross value of the allocated fish at point of sale was estimated at about \$34 million.  
Net export return to

Meanwhile, in Chile...

## JAPANESE INVEST IN NEW FISH PLANT OPERATION

THE Chilean government has agreed to a joint fishing and processing venture between local interests and Nippon Suisan Kaisha of Japan.

According to a report in the *Japan Economic Journal*, the

joint firm — Empresa de Desarrollo Pesquero de Chile Ltd. — will start operations this month. The annual catch is expected to be about 30,000 tons.

The new company is to build a processing plant and cold store in Puerto Montt

next year. The joint venture is 70 per cent owned by Nippon Suisan, 10 per cent by Mitsui & Co. and 20 per cent by the Chilean firms.

Fish processed will be exported to the U.S. and Japan.

## EEC seeks deals with Angola

A TEAM from the European Economic Community will visit Angola this month to discuss fisheries co-operation.

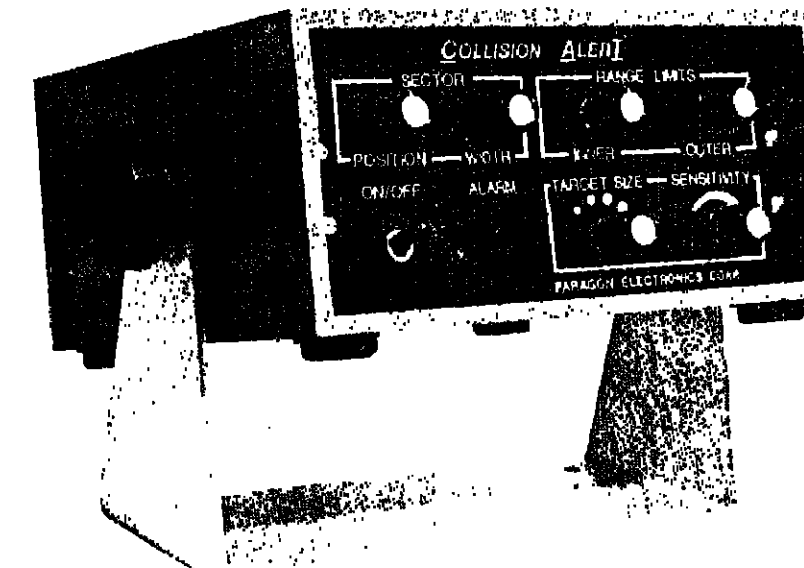
This follows the Belgian Foreign Minister's recent visit to Luanda and President Neto's new and more open policy towards the EEC.

The Angolans are anxious not to let their waters, which have been closed to foreign fishermen for some time, be entirely exploited by the Russians.

Denmark, France, Italy and West Germany are all interested in fishing there.  
● EEC mission to Senegal: turn to page 7.

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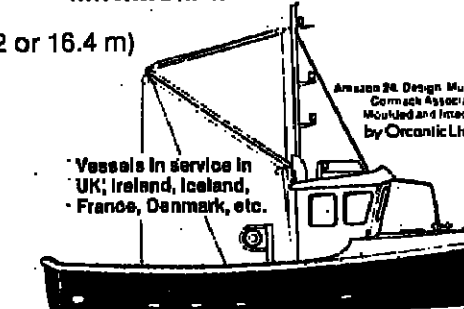
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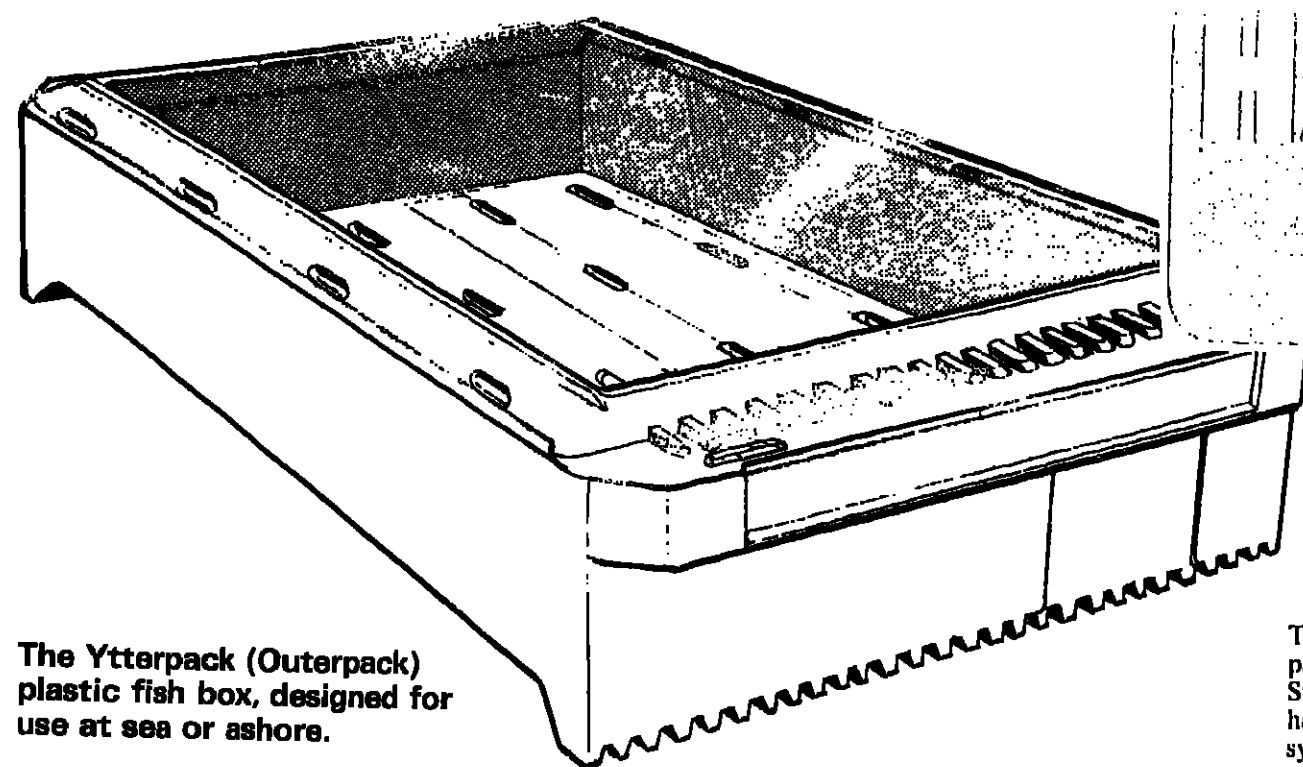
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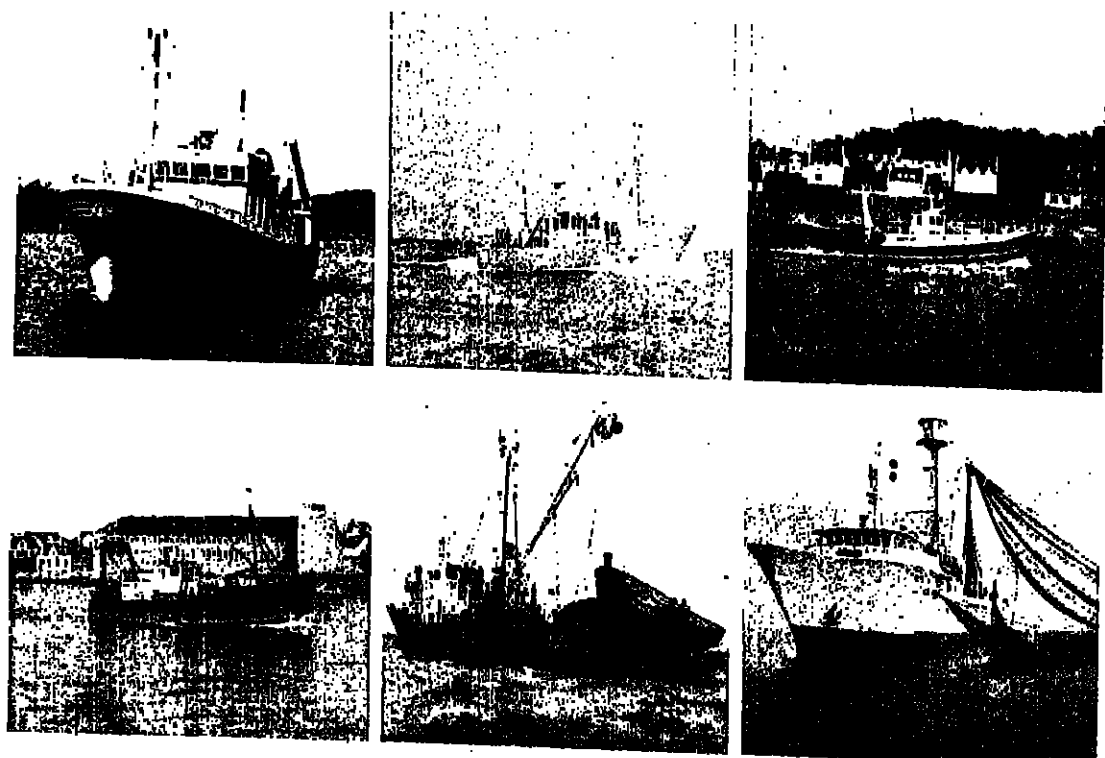
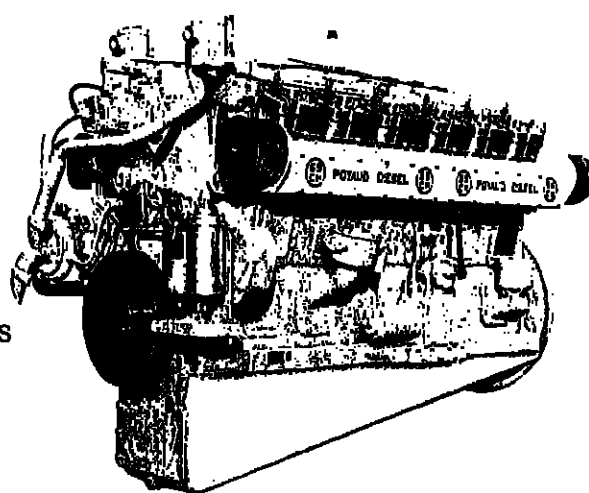
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# HANDLING SYSTEM BUILT AROUND PLASTIC BOX

Reports from  
MIKE PURVES and  
GERRO WHISKEY

THE FISKLADAN company of Gothenburg, Sweden, has developed a handling and transport system for fresh fish around its Ytterpack plastic box. This FOL (Fish on Line) system will be incorporated on a prototype mobile service terminal for Swedish Baltic Sea trawlers.

Already widely used in Sweden, Denmark and now Norway, the Ytterpack is a shipboard container suitable for shore handling. It is designed to replace the traditional wood box over which it is claimed to have the following advantages:

- Economy, with long life offsetting higher initial cost.
- Strength and durability. The material is impervious to damp and temperature extremes.
- Versatile stacking, special grooves allow off-centre stacking to follow hull shape in the vessel hold.
- Ease and safety in handling, stacks lock on long and short sides, and the moulded handles are specially designed.
- Hygiene - smooth white surfaces, the bottom clear of the ground, and the short legs keep boxes apart.
- Better cooling and drainage - numerous holes allow seawater to permeate through the stack.
- Palletless handling.

Fiskladan intends the FOL system to keep handling of fish to an absolute minimum, thus helping to maintain quality and value.

### Equipment

A range of ancillary equipment has been designed around the Ytterpack container, including pneumatic lifting for on-board use and an elevator for moving full or empty boxes.

An Innerpack disposable two-part liner is available to give additional hygiene.

Much thought has been applied to the need to preserve freshness, and thus quality, right to the point of sale, and an aluminium foil "space blanket" insulating cover has been introduced for box stacks. This Spacepack is claimed to keep the fish temperature constant from grounds to consumer.

To permit joint transport in unit loads, a water-catching Aquapack pallet is available. This prevents leakage so that a box stack can share a lorry with other goods, without being a bad neighbour.

Reusable boxes need regular and efficient washing, and Fiskladan has devised a compact machine tailored to the containers. The Tvaatpack machine is made in corrosion-

proof materials, washing up to 12 boxes a minute on a water usage of 30 litres/min. The machine has a 515 litre tank. Efficient washing is aided by a novel feature of the Ytterpack container - the sides are completely flat and free from moulded projections.

The inventory of specially-designed ancillary equipment is completed by Comipack, a 12-kilo non-returnable box for retailers. Fryspack, a special carton for deep-freezing, and Lyfpack the collective name for a range of loading hooks, truck forks and lifting devices for palletless handling.

Fiskladan's thinking extends some way beyond the supply of integrated hardware.

In its ultimate form, Fish On Line would use modern computer technology to register details of a catch, direct the vessel to the most suitable port for current market demand and co-ordinate shore transport.

### Keep track

The system would keep track of circulating boxes and direct them back to vessels as needed, and Fiskladan is now working on the design of an automatic box-filling machine, to dispense accurate 30-kilo loads of fish. The scales would be linked to a micro-computer to keep an accurate tally, as Fiskladan feels that inaccurate weighing can cost a lot of money in the long term.

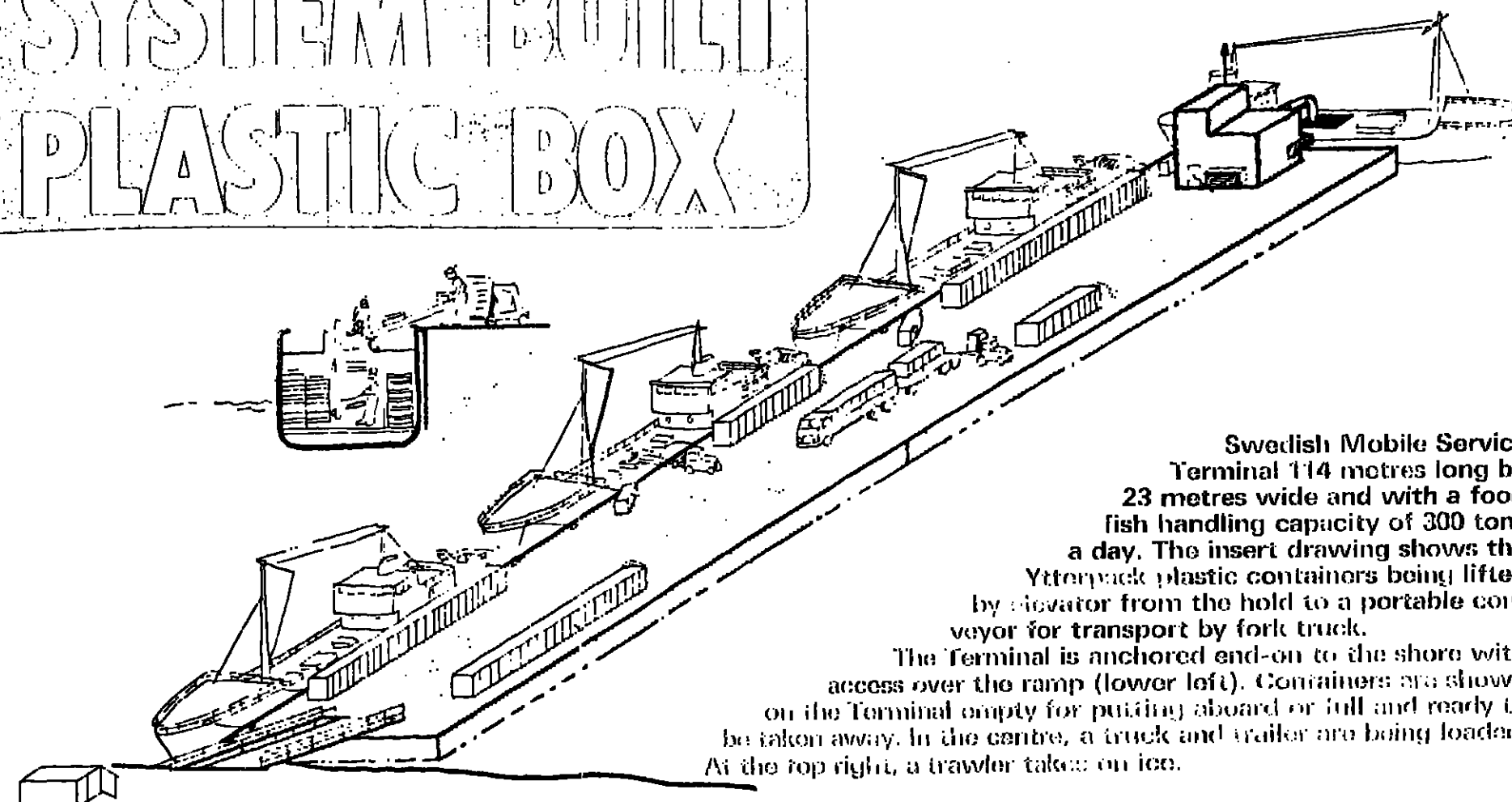
This may all seem a bit fanciful, but already much detailed work has been done on the FOL system, and the hardware is a reality.

Fiskladan has worked with fishing companies and the Chalmers University of Technology, Gothenburg, which has completed costings and prepared computer paperwork for the entire transport chain.

### Economical

It is claimed that this analysis shows the FOL system to be more economical on handling and transport costs than many current operations; and, as the unit cost of fish continues to rise, preserving quality and hygiene standards (a key aspect of the system) will gain in importance.

The first FOL system is likely to be established in Sweden, but the originators believe that it has great possibilities in many areas: reviving or establishing the application of a really efficient distribution system for high quality fresh fish. The system is now patent-pending in Europe, the USA, Canada and Japan.



Swedish Mobile Service Terminal 114 metres long by 23 metres wide and with a food fish handling capacity of 300 tons a day. The insert drawing shows the Ytterpack plastic containers being lifted by elevator from the hold to a portable conveyor for transport by fork truck.

The Terminal is anchored end-on to the shore with access over the ramp (lower left). Containers are shown on the Terminal empty for putting aboard or full and ready to be taken away. In the centre, a truck and trailer are being loaded. At the top right, a trawler takes on ice.

SHIPYARDS these days are constantly on the lookout for alternative uses of their building capacity. One new idea which is arousing interest in Sweden is that of a Mobile Service Terminal for fishing fleets testing a new catching area or (as in the south-west of England at present) operating intensively for a short period from a temporary base.

The core of the idea came from the technical management of the firm Fiskladan Packing AB of Gothenburg. The development has been carried out by Svenska Varv (a government development service for shipyards) and the builder

Gotaverken in Gothenburg.

In addition to giving considerable flexibility to a fleet, the Terminal is intended to speed-up handling and help maintain quality of the product. Therefore, as will be seen from the description of the Fiskladan Ytterpack boxes and Fish On Line system, this company has been able to make a significant contribution in

hardware as well as ideas.

The Terminal can be easily moved and can be anchored offshore with a gangway for trucks. The prototype is being built to service Swedish small trawlers working seasonally in the Baltic. It will be tested by them during the next season, which starts in January-February next year.

From this prototype and experience

in working it, further terminals will be developed.

It is designed to serve six 30.5 metre (100 ft) boats landing at the same time. Using an elevator in the hold, the landing rate would be about 6,000 boxes a day. While others are landing, one trawler can be taking on ice. Other equipment on the terminal will supply water and fuel, dockside electrical power, and storage space for industrial fish.

The prototype is being built like a vessel in two units of 57 metres long by 23 metres wide. Other units can be added to contain factories or stores.

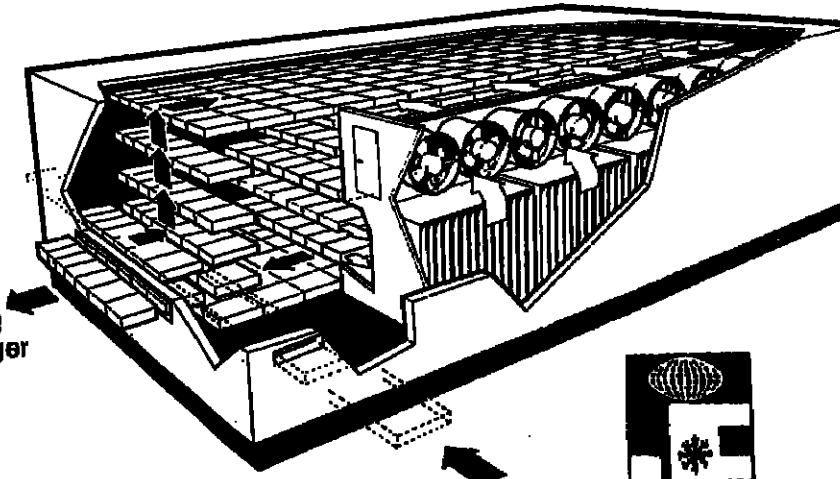
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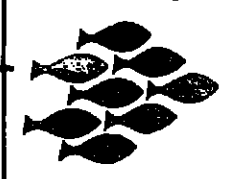
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Nor-Fishing '78



# NORFISHING GOES TO OSLO

FOR ITS seventh showing since it was first presented in Bergen in 1961, followed by Trondheim in 1965, 1969, 1972, 1974 and 1976, Norway's International Fisheries Fair comes to Oslo and to the big Sjolyst exhibition centre.

Nor-Fishing '78 will be open from November 20 to 26. In addition to the stands of more than 150 participating companies, attractions of the exhibition will include a national seminar on possibilities for expanding the blue whiting fishery, and an international seminar on post-harvest technology and investment in developing countries.

DESPITE its change of venue and the time for its showing, Nor-Fishing promises once again this year to be a major international occasion for the fishing industry.

The exhibition will be attended by representatives of some 30 developing countries. There will be two important seminars, and support from more than 150 exhibitors showing the products of hundreds of manufacturers.

The change of venue resulted from differences of opinion with the Fisheries Directorate and other organi-

sations over the frequency of the show.

Aware of the international status which the exhibition had gained during its two-yearly showings in Trondheim, Gunnar Skuggeled, who heads Norges Varemesse (the organising company), opposed suggestions that it should be staged at three or four-yearly intervals.

Trondheim also presented problems. The Nidaros halls there overflowed into temporary structures which, by 1976, housed nearly half the exhibits.

Without permanent structures, or substantial financial help from the city of Trondheim, the exhibition could not grow and was certain to experience increasing difficulties covering its costs.

Discussions about the future soon revealed two sharply different views on the role of Nor-Fishing.

It had been created in the 1960s as a "fishing fair" with events such as "fishermen's day" and the sail past of boats in Trondheim fjord as prominent features.

While these were kept as the exhibition grew, some people

felt that its rising international status had so changed its character that it had lost touch with the fishermen and their organisations.

There was also a feeling among some regular exhibitors that two-yearly shows were too frequent.

But Norges Varemesse officials argue that many of the smaller Norwegian firms taking part did not agree. The exhibition has been their big chance of showing people from all over the world what they are doing and what they can supply.

Mr. Skuggeled and his colleagues contend that Nor-

## With two seminars this year

Fishing has become "international" through its own efforts and achievements and that it should not risk this hard-earned status by moving out of its two-year "slot."

As FNI has pointed out, there is an unfortunate proliferation of fishing exhibitions.

Any regular exhibition switching too drastically, risks being ousted by newcomers or by established shows forced to move.

Fortunately for Norges Varemesse, it has its own large and modern exhibition halls at the Sjolyst Centre in Oslo. They have more than enough space for Nor-Fishing. But they are also heavily booked hence the change from August to November.

For some of Nor-Fishing's regular supporters, the change has been too much. But the organisers did get the agreement of the Fisheries Directorate, to stay in 1978.

One immediate benefit is access to excellent conference rooms in the centre. Early efforts have been made to prepare seminars in association with the exhibition.

There will be two, widely different in character.

The first is being run in co-operation with the Export Council of Norway, the Norwegian Agency for International Development (NORAD), and FAO.

Its subject is post-harvest technology and investment in developing fisheries.

FAO played a considerable part in preparing the programme and the Export Council has arranged for people from developing countries to come to Oslo to take part.

The second seminar looks at the North Atlantic blue whiting fishery and considers how this may be expanded.

Manufacturers from outside Norway are once again prominent participants.

They include the Baader company with its usual impressive display of process-

ing machines at work, and Krupp Atlas Elektronik whose presentation will include the new 950 panoramic sonar, described in FNI in October.

Another top firm in processing machinery, Arencos of Sweden, will be back again.

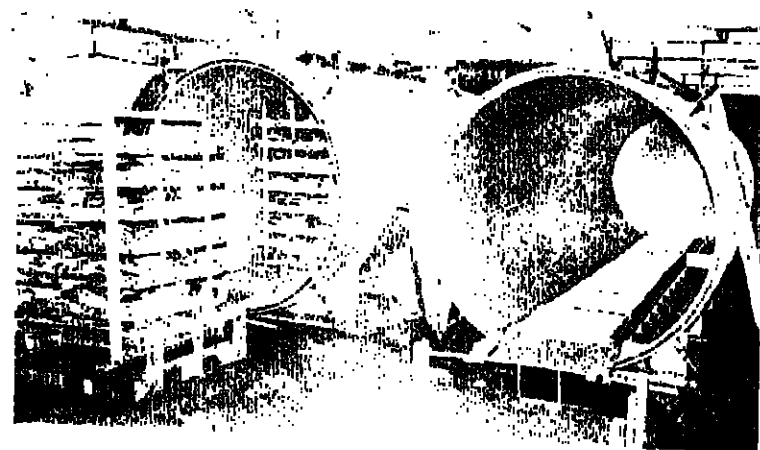
British participants include the GRP boatbuilder Orcant (formerly Halmatic) and the Pelters Company.

From Poland, Centromor will be showing models of the series-built fishing vessels available from its yards.



Norges Varemesse's Gunnar Skuggeled — fight to keep up two-year exhibition.

## TWO VACUUM THAWING UNITS FOR SALE COMPLETE WITH MACHINERY



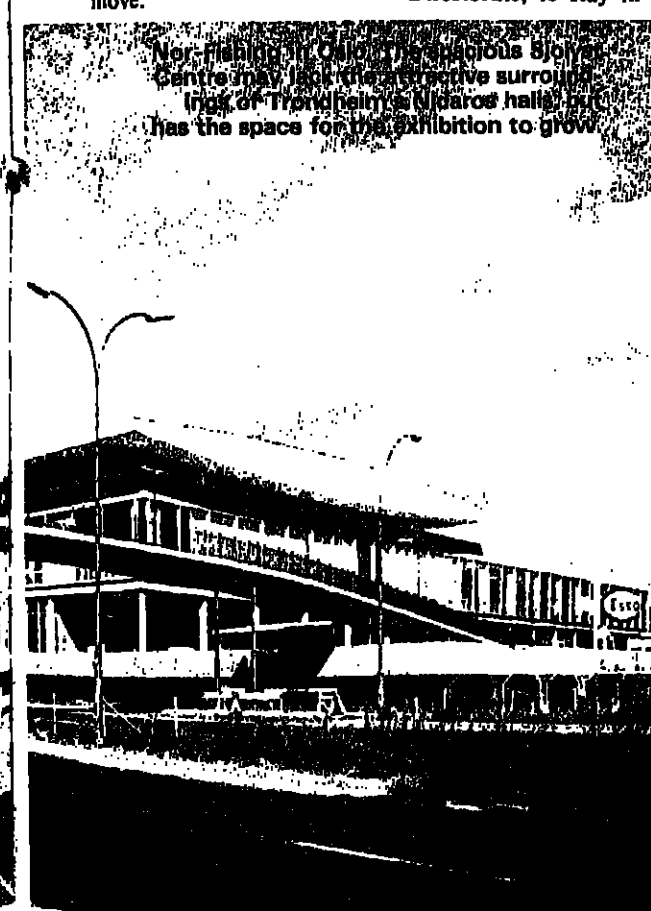
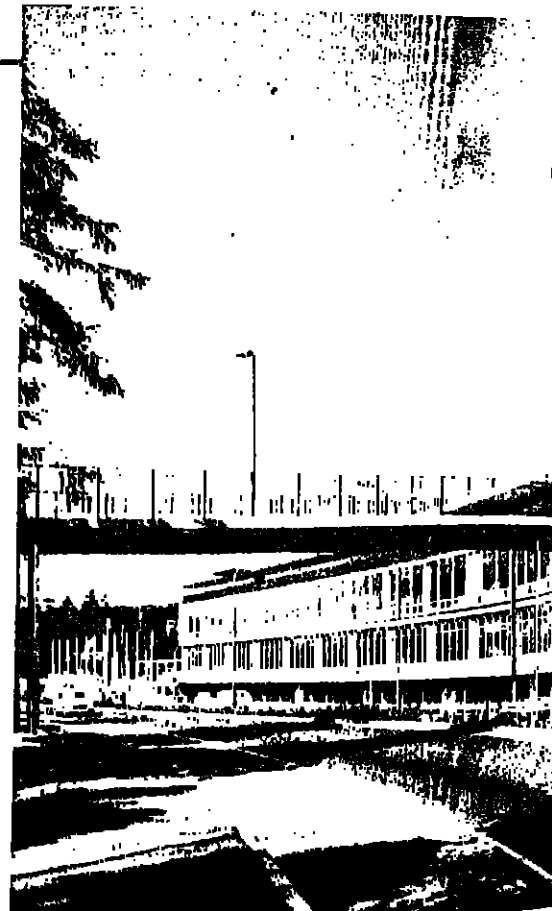
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## ON THE AGENDA

● THE FIRST of the two seminars being held in conjunction with Nor-Fishing will be in the Conference Room of the Sjolyst Centre. Its theme is Post-harvest Technology and Investment in Developing Countries. In organising it, Norges Varemesse has had the support of the Export Council, FAO and NORAD.

This seminar will be preceded by a film presentation "Targets for fisheries development," an inaugural dinner and a Norwegian evening in the Najaden restaurant on Bygdoy on Monday, November 20.

It will take place over the two following days, opening at 9 a.m. on Tuesday, November 21.

The seminar idea aroused the interest of Herman Watzinger, then head of the Fisheries Department of FAO; and the seminar leader and overall chairman is W. Philip Appleyard, chief of FAO's Fishery Industries Development Service.

The first session will concentrate on post-harvest technology and discussion leaders will include Dr. Wolfgang Krone of FAO, J. Maud Kordylas of the Food Research Institute in Ghana, Gerdt Lovold of FIDECO and Ahmed Kaman of Malaysia.

Speakers will talk about uses of underexploited resources through more efficient handling and preservation, new products and processing methods and improved market identification and promotion.

Investment needs will be the subject of the afternoon session. Speakers will include Ducksoo Lee of the World Bank, T. Oforiokuma of Nigeria, Aida Eld of FAO.

On the following day, the seminar will consider the funding of investment. Discussion leader will be Per Gustavsen of the Regional Banks of Norway. Speakers will include Julio Luna of the Inter American Bank, and Ahmed H. Radwan of the United Arab Emirates.

Norges Varemesse and the Export Council are arranging to bring representatives from some 30 developing countries to Nor-Fishing. These visitors will be given every opportunity.

● A SEMINAR of more immediate interest to fishermen in Scandinavia and other European countries will be chaired by Arnulf Midtgaard, director of the State Fishery Bank in Norway. It will consider the expansion possibilities in blue whiting fishing and will take place on Friday, November 24.

This is being billed as a national seminar. It will be in Norwegian but will be translated into English.

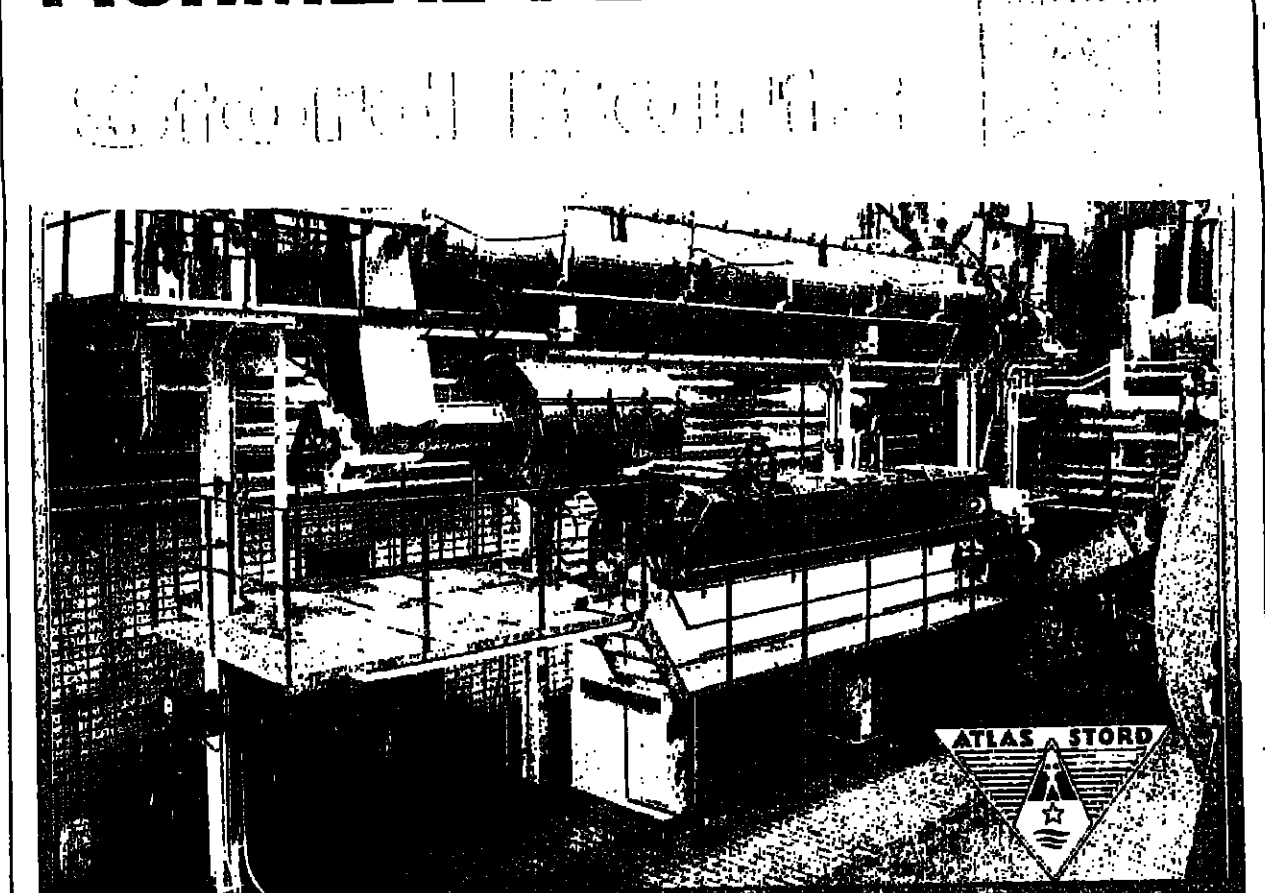
The first session will look at the resource, its area of distribution and size of catchable stocks.

Then Steiner Olsen of the Institute of Fishery Technology Research will deal with gear and catching techniques.

Simrad played a prominent part in the fishery, particularly with its new device for measuring the amount of fish in the cod-end. Following Mr. Olsen, Arnulf Borud will discuss fish finding equipment for blue whiting.

After a session on products and markets, the seminar will close with a panel debate on catching techniques and equipment requirements.

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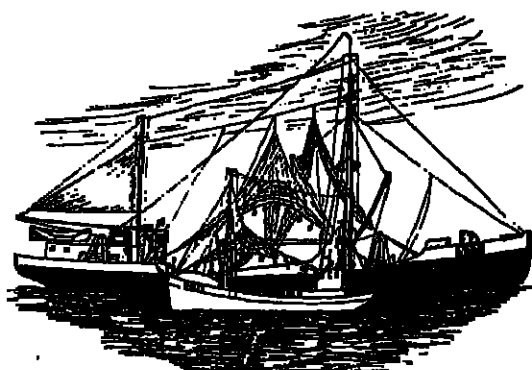
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## Autoliner is scaled down

THE DEVELOPMENT of the automatic line fishing system in Norway has gone on for almost as long as Nor-Fishing itself.

It appeared first in the 1960s as a baiting machine, then as a system. Later the 3-F project showed vessels that could be built around the system, and in 1976 the makers, O. Mustad & Son, were able to demonstrate a ship with the equipment installed.

Autolining is now breaking through into the smaller class of vessel and designers Fiskurstrand and Eldoy of Alesund have developed a 59 ft. (18 metre) longliner tailored to the system.

A model of this boat will be on show at the Mustad stand in Oslo. She will be built for about 3.2 million kroner (£320,000) with Autoliner.

The new vessel will have accommodation for a crew of seven and hold capacity of 55 cu.m.

### Manoeuvrable

She will be highly manoeuvrable with becker-rudder and small sidethruster. Two 200 hp high-speed engines will turn a single screw through one gearbox.

According to Mustad & Son, 55 vessels will be fishing with Autoliner by the end of the year.

The system had its first success catching dogfish. Fifteen vessels in the fishery

are now using the system. They are around 100 ft. long, have a crew of nine to 11 men and haul an average of 21,000 hooks per 24 hours. A good catch for a 12-day trip is about 100 tons.

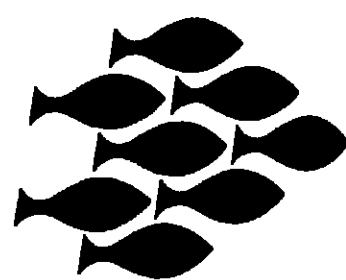
Cusk and ling are caught in another growing Autoliner fishery. Twelve boats are taking part, among them the

Scottish *Anni Elisabeth* and the *Oyliner*, first purpose-built Autoliner.

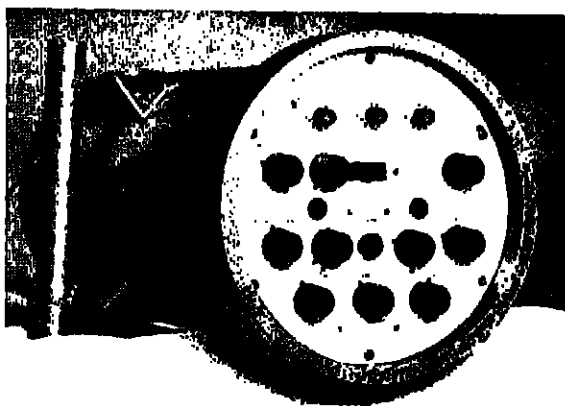
Other fish now being caught include, silver hake and cod off the east coast of Canada and cod off the Faroes.

Pacific cod and black cod will be fished in the Pacific by a new Autoliner-purse seiner being built in Vancouver.

Nor-Fishing '78



## New lightweight 'jigger'



FISKERIAUTOMATIKK of Sortland will be introducing its new lightweight automatic jiggling machine.

The firm's standard machine is widely used and some 4,600 have been sold. The latest version is equipped with electro-magnetic brake.

In addition to automatic fishing at present depths and automatic hauling, the new machine can fish along the bottom at changing depths.

# THE BABY OF THE FAMILY

## Small boat sonar from Simrad

SIMRAD is launching its new SY sonar — described as "the little brother of the family" — at Nor-Fishing.

"The SY sonar has been designed specially for inshore fisheries. It is the ideal sonar for small boats fishing in reasonably shallow water," says the Norwegian manufacturer.

The SY consists of a cabinet with a unique PPI presentation, a small but powerful hull unit with a high-source ceramic transducer, and a compact transceiver.

A paper recorder will also be available to work in conjunction with the PPI presentation.

The hull unit has been designed to fit very small fishing boats.

The transducer is said to give an exceptionally clear transmission beam. It is

stabilised to keep constant contact with the target even when the boat is pitching.

Shown on a 12-inch diagonal screen, the PPI presentation can be started from the bottom, centre or top of the screen.

Direction of the sonar beam can be altered at any time to give a new search pattern, and beaming can be manually controlled.

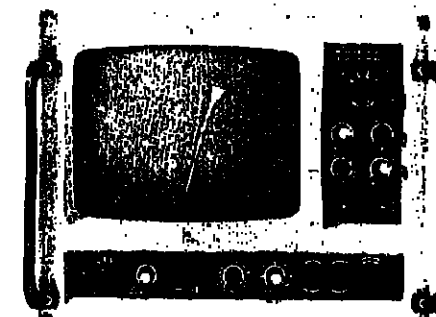
The SY sonar has eight ranges from 75 to 1500 metres.

A special feature is the one-ping memory which improves detection especially on longer ranges.

A scope filter takes away a lot of the noise echoes.

Visitors to the Simrad stand will also have a chance of seeing and discussing the new catch indicating system. This has a very successful debut in Norway's blue whiting fishery off the Faroes in the spring of 1978.

Trawling for blue whiting can be difficult.



SY sonar — ideal for small boats.

Because of the great amount of fish, nets have been filled in 10 to 20 minutes. This has resulted in damaged nets, loss of catch and a break in fishing to carry out repairs.

To try and solve the problem, Simrad set up a research team and in 1977 its work led to the catch indicator which can be used in conjunction with the Simrad trawl eye.

"Initially," said the company, "we tried to

keep the number of indicators in use as low as possible due to the uncertainties there will always be with new products."

Despite this, 40 trawl eyes with catch indicators were used by blue whiting vessels.

At the end of the season — a record one with a blue whiting catch of 115,000 tons — Simrad arranged conferences in Bergen and Alesund. Users were invited to talk about their experiences and to discuss any problems.

The indicator was used about 1,300 times in the season.

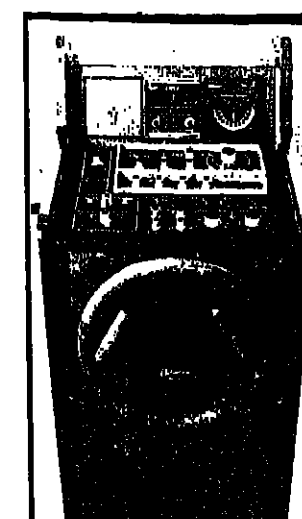
"Considering this," said Simrad, "the problems with the equipment were small."

"The information we have collected will result in improvements to the equipment and its installation — and in the preparation of an operator's manual."

The broad conclusion of the two conferences was that the trawl eye with indicator was an absolute necessity when trawling for blue whiting. Some users thought it improved catching efficiency by at least 50 per cent.

## Stickwater plant uses waste heat

A WASTE HEAT evaporator for concentrating stickwater will be one of the products featured on the stand of Stord Bartz, the Bergen-based engineering firm which has supplied equipment to more than 600 fish meal plants in 60 countries.



This new SS-3 steering console from Robertson A/S Radio Elektro will be making its debut at the show.

The compact unit is suitable for ships of up to the largest tonnage.

The main modules comprise a steering unit with two independent electrical systems, Autopilot, gyrocompass control and rudder command course indicator.

This vacuum evaporator works on the same principle as the ordinary stickwater evaporator. But it uses exhaust vapour from the drier instead of live steam. And this, says Stord Bartz, saves up to 20 per cent in fuel costs.

The evaporator can be supplied as a one-effect or two-effect machine.

Exhaust vapour from the drier is sucked through the system by a centrifugal fan and is supplied to a heat exchanger in which the circulation tubes for stickwater are located.

Condensate is discharged to drains or the water treatment plant. Waste vapour from sources other than the drier comes through the inlet valve.

Gases not condensed are recirculated to the drier after having passed through a demister and a preheater.

The liquid side of the evaporator works under vacuum by means of a barometric condenser with vacuum pump. The boiling stickwater is circulated via the cyclone in which the evaporation takes place. Stickwater concentrate is discharged by the pump.

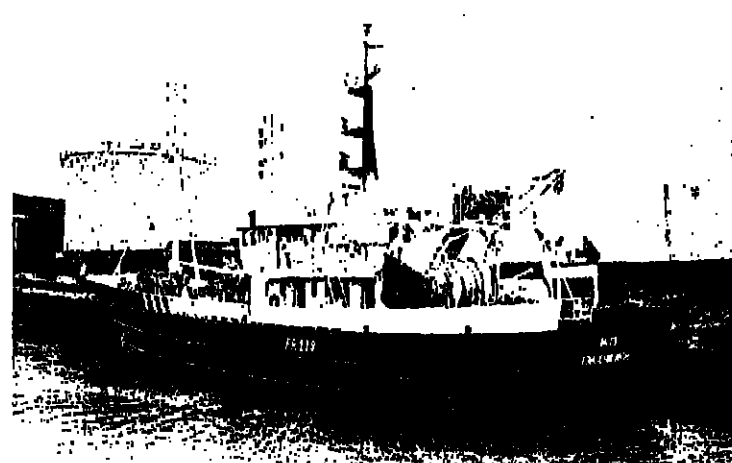
## RODDING MACHINE

AMONG the processing machines to be shown by Trö Maskinindustri will be a new device designed to rod mackerel, herring and similar fish, heads on or off.

The fish are placed by hand on a special feed table. Rodding is done mechanically by pushing release levers. The rod with fish is then lifted out manually and placed in the smoking frame.

The machine can be adjusted for different fish species and sizes.

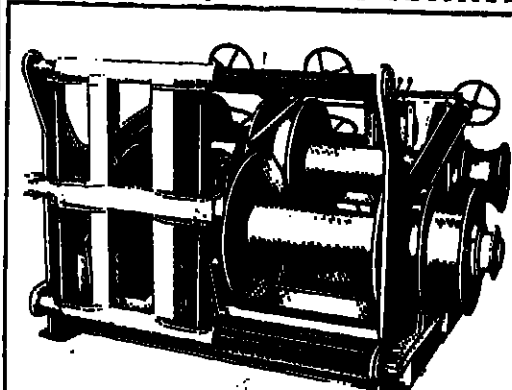
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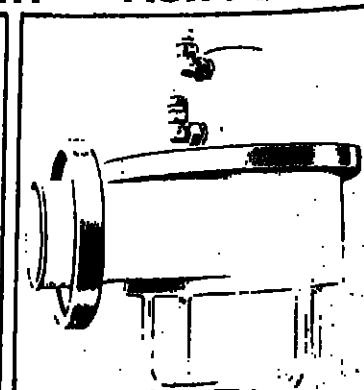
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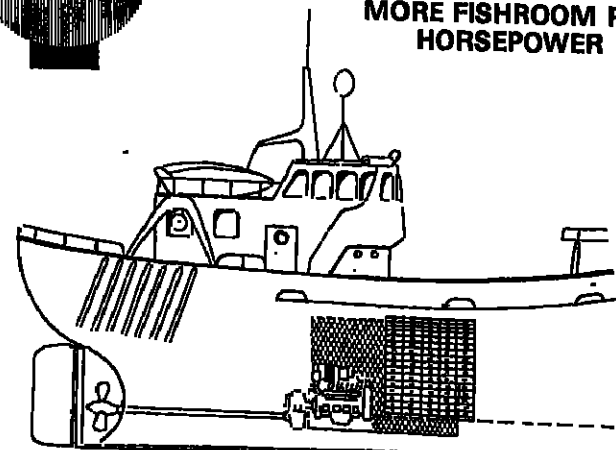
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BAADER KEEPS UP THE PACE—turn to pages 22 and 23

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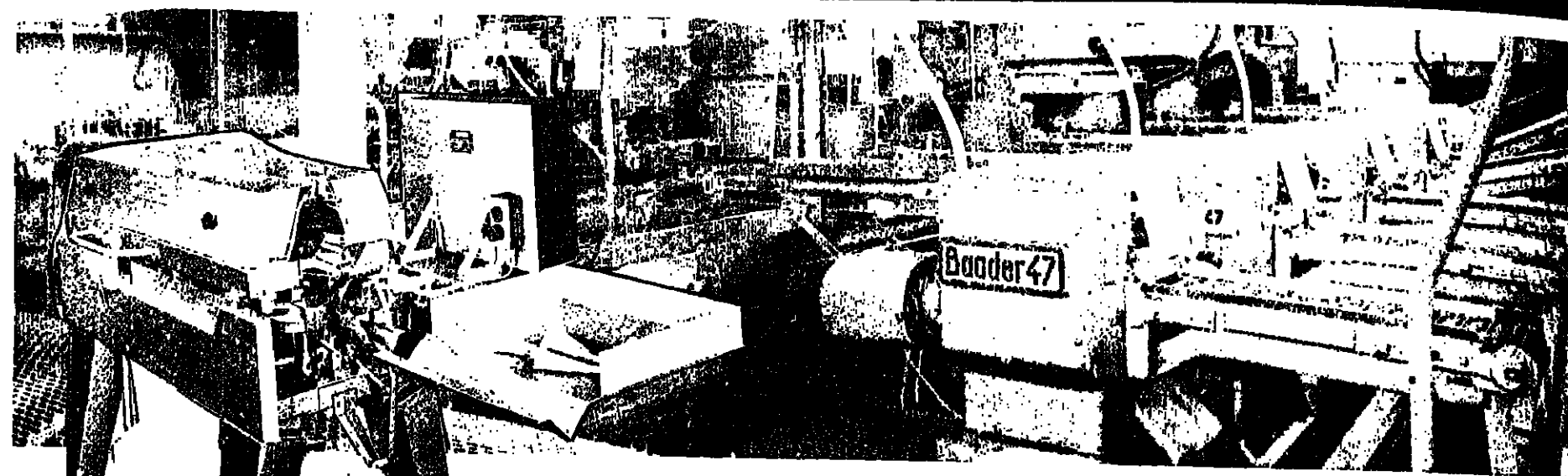
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Although superseded by the Type 51, Baaders 47 skinners are still perhaps the most familiar of all fish processing machines. Hundreds are installed in factories around the world and in ships such as the West German stern trawler above. The inset picture is of the Baader 195 filletter.

## NEW

## THE LATEST NEWS ON FISHERIES

During the period 20-26 November The 7th International Fisheries Fair, Nor-Fishing '78 - will be held in Oslo. This is a trade fair of a high international standard, where you will meet people from all over the world, with a strong interest in and knowledge of the fisheries industry. Nor-Fishing is considered to be one of the leading fisheries fairs in the world. Large and small firms present their products and news for the fisheries industry, and you will have a unique opportunity to find out about the very latest news in this field. In conjunction with the exhibition we invite you to participate in the seminars to be held at The Sjølyst Centre.



### The International Nor-Fishing seminar: POST-HARVEST TECHNOLOGY AND INVESTMENT IN DEVELOPING FISHERIES

20th Nov  
Film presentation, TARGETS FOR FISHERIES DEVELOPMENT  
Opening dinner - Norwegian evening (Special registration is required. Attendance Nkr. 200.-)

### 21st Nov. POST-HARVEST TECHNOLOGY

Speakers:  
F.A. Petersen, Project Coordinator for IFRC, Guyana Food Processors Ltd., Guyana.  
Dr. Wolfgang Krone, Chief, Fish Utilization and Marketing Service, FAO, Italy.  
Mrs. J. Maude Kordylas, Officer-in-charge, Food Research Institute, Ghana.  
Gerd Løvstad, Managing Director, HDECO (Fisheries Development Co. Ltd.), Norway.  
Ahmed Kamel, MARDI, Malaysia.

The first session will be devoted to the improvements of post-harvest technology in developing fisheries and to means of expanding the use of under-exploited resources through more efficient handling and preservation systems, new products and processing methods and better market identification and promotion. The question of reducing post-harvest losses and the use of trash fish and unconventional species will receive particular attention.

### INVESTMENT NEEDS IN DEVELOPING FISHERIES

Speakers:  
Ducksoo Lee, Chief, Agriculture

### Division, South Asia Projects Dept. The World Bank, Washington D.C., USA.

Dr. Eng. H. Nilsen-Moe, Norconsult A/S, Norway.  
T. Olorokun, Managing Director, Niger Sea Food Ltd., Nigeria.  
Tengku Uthuddin bin Abdul Kadir, Director General of Fisheries, Ministry of Agriculture and Fisheries, Malaysia.  
Miss Aida Eid, Senior Adviser, FAO Investment Centre, Italy.

The second session will discuss the specific investments required by developing fisheries in infrastructure, processing, distribution, storage and marketing facilities and how the necessary transfer of technology in both hardware (capital items) and software (know-how) might be best achieved. Representatives of developing countries will have an opportunity to express their views on the needs of their fisheries for investment in post-harvest technology.

### 22nd Nov. THE FUNDING OF INVESTMENT

Speakers:  
Per Gustavsen, Director, Council of the Regional Banks of Norway, Norway.  
Zaki Azam, Project Manager, Fisheries and Livestock Projects Dept., Asian Development Bank, The Philippines.  
Julio Luna, Chief, Fishery Sector, Inter-American Development Bank, Washington D.C., USA.  
Arvid Fløegstad, Director, Eksportfinans A/S, Norway.  
Ahmed H. Badwan, Economic Adviser, Abu Dhabi Fund for Arab Economic Development, Abu Dhabi, United Arab Emirates.

The third session will consist of a review of potential international collaboration and assistance in funding these investment needs. Consideration will be given to criteria for investment project preparation, to the role of joint ventures and similar arrangements, to the funding activities of international and commercial banks and to such associated factors as suppliers' credit systems and credit insurance schemes.

Proceedings and discussions at the international seminar will be in English. Seminar fee: Nkr. 1,200.-, papers and luncheon included. Registrants will be charged 10% of the registration fee upon cancellation.

### The national Nor-Fishing seminar: (in Norwegian only) EXPANSION POSSIBILITIES IN BLUE WHITING FISHING

24th Nov  
Resource possibilities in blue whiting fishing.  
Area of distribution and catch possibilities.  
Fishing rights and economic importance.  
Catch-technical conditions.  
Gear and catch techniques.  
Fish-finding equipment.  
Products and markets.  
Panel debate on catch techniques and requirements of equipment.

The participation fee for the national seminar is Nkr. 200.-, papers and luncheon included.  
Please return the filled-in coupon below. We will send you the invoice with confirmation of your participation. Seminar programs subject to alteration.

Org.: Norges Varesmesse (The Norwegian Fair Organization)  
P.O. Box 130 Skøyen, Oslo 2, Norway.  
Tel. (02) 55 37 60. Tlx.: 18746 messen

In November Oslo stands forth as a "city of light" as all of the Christmas displays begin at this time. For this reason you will have the chance to make pleasant shopping trips. In addition, we strongly recommend visits to the many restaurants, which offer typical Norwegian Christmas specialties. We hope you will visit Oslo in November, and have some memorable days with people from all over the world sharing your interests.

Mond. 12-18, Weekd. 10-18, Satd. 10-18, Sund. 13-18. Exhibition Pass and catalogue Nkr. 20.-

To: Nor-Fishing '78, Norges Varesmesse, P.O. Box 130 Skøyen, Oslo 2, Norway.

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☐ I want to attend the national seminar  
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Please use block letters!

FOR NEARLY 60 years, the history of fish processing has been deeply influenced by the development of machines, first started at Nordischer Maschinenbau Rud. Baader in Luebeck.

After the mechanical processing of fish with bone removing machines for herrings, an array of other machines evolved for heading, cutting, filleting and skinning; for special processes such as nobbing of sardines and herrings; machines for drying plants; sorters, washers, descalers and bone cutters and bone separators.

Baader is not only the oldest, but is also recognised as still the leading maker of these complex processing machines.

Combining research, technical know-how and practical experience, we have developed machines and complete factory lines for use ashore or at sea. In fact, fish processing at sea is one of the basic ideas developed in Luebeck at Baader's as far back as the 1920s.

### Pose new problems

But increasing international use of Baader machines continues to pose new problems for our technicians. Fish, even of the same kind, can vary considerably in the same area, depending on growth conditions and other factors.

For this reason, machines often have to be readjusted or rebuilt to suit changes in conditions. This requires long and complicated tests at the actual location.

To quote a recent example: Several years ago our white fish filleting machine, the Baader 190, was developed to produce bone-free fillets. This machine has been widely used in European fish plants, at sea and ashore.

But overfishing of traditional grounds, spreading fishing zones and cuts in catch quotas have forced an increase in trips to distant grounds.

Through this, it was found that the Cape hake (*Merluccius capensis*) in the south-east Atlantic could be filleted by the 190 machine.

Hake of merluza also occurs in large stocks across the South Atlantic off eastern South America. But this hake (*Merluccius hubbsi*) differs from the Southern African hake in structure.

Baader technicians had to carry out extensive tests on the fish. They were finally able to adapt the 190 to the South American hake by remodelling a few components.

Our world-wide involvement in fishing has created a reputation which puts us under a world-wide obligation. This takes us beyond further development of tried and proved machines to new processing principles and their application to types of fish which, up to now, have never been mechanically processed.

We might take the Australian fish industry as an example. Baader engineers had long thought of ways to process these tropical water-

## BAADER:

fish by machine. But, because of the many varieties, it was not possible to consider a special machine for each.

It was decided therefore to work on one machine which could fillet different types without the need for alterations. The problem is not so much the outer shape but the arrangement of the ribs. This varies species by species and needs special knife positions.

Our solution was the Baader 195 machine and the prototype went out to Australia for extensive tests on site.

These trials took months to complete and involved both the Baader team and Australian processors.

The original idea of one machine for different species was shown to be right and it was even found that the range of the 195 could be considerably widened.

Fish which it can process

# MACHINES TO MEET CHALLENGES

AT ALMOST every major fishing show the Baader stand has come to be regarded both as a focus of interest and as a sign that the exhibition is likely to attract the fish processors. The stand is almost always large, expensive and packed with machines and it is a place where people can bring their processing problems for expert attention.

In this article Dieter Rother of Baader explains how his company strives to maintain the lead in machine processing.



Baader in action in an Icelandic factory.

## the story continues

include mullet (*Mugil cephalus*), barracouta (*Thyrstites atun*), warehou (*Seriola lalandi*), dorado (*Coriphaena hippurus*), pompano (*Trachinotus carolinus*), Spanish mackerel, red snapper and sea trout.

Then we found that it could also fillet the red perch (*Sebastes marinus*) well known in European waters.

Long-standing ideas and modern technology can be combined to bring in new mechanical developments, as with our fillet skinning machine, the Baader 51.

Our earlier machines applied two skinning principles: 1 Cutting and skinning starting at the tail through the interplay of oscillating knife and clamp rollers. The Baader 47 works in this way but the tail end starts means some waste.

Also, this principle is limited in capacity because the skinning tools are only able to grip the fillets one by one. Knives and drive mechanism have to be generously designed to keep abrasion within limits and so the machine tends to be noisy. But these disadvantages were thought to be more than compensated for by the quality of the fillet.

2 Cutting of the skin by rotating knife belt as before but not necessarily starting at the tail end.

Equipped for this, the Baader 50 supplemented rather than replaced the 47.

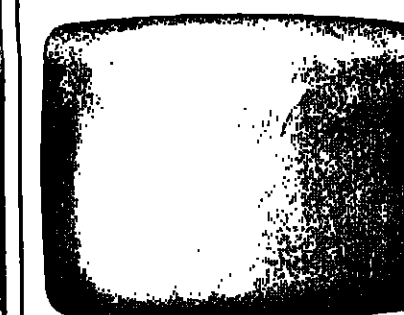
Its application is wider as the skinning thickness can be varied. Also, deep skinning (removal of the fat layer) is possible.

The 50 has been found very suitable with the 195 for tropical fish.

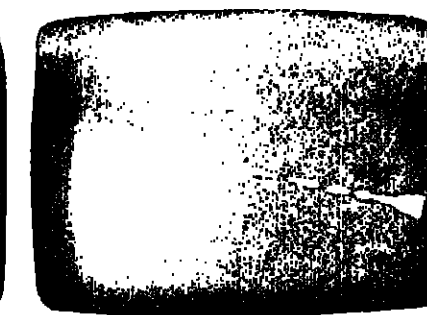
Continued on page 29.

## SIMRAD SY. New sonar for small and medium size vessels.

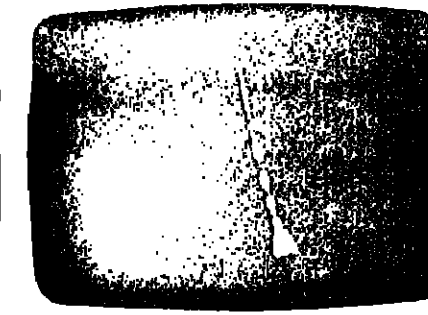
### With PPI scope presentation.



Sweep start at the bottom for searching ahead.



Sweep start in the center for searching to the side.



Sweep start at the top for searching behind the vessel.

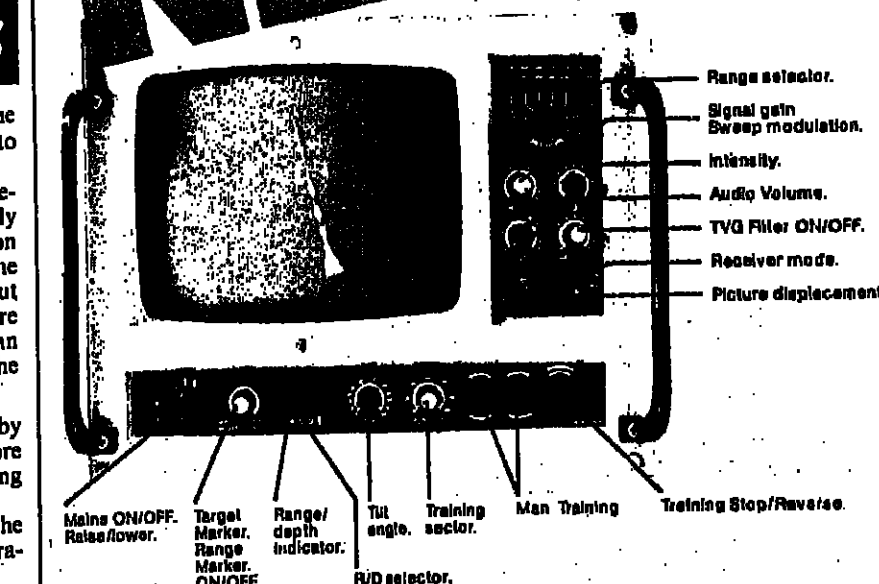
The Simrad SY Sonar is the ideal sonar for smaller vessels fishing in reasonably shallow water. The SY consists of a cabinet with a single type of PPI presentation, a small but powerful hull unit with a high precision transducer and a rotating up fish just off the sea

The display unit is compact and can easily be installed even on the smallest bridge. The ceramic transducer with its high intensity gives an exceptional clear transmission which is especially beneficial when working in shallow water or a rough sea.

The fully strengthened dome has been tested out to withstand the worst of sea conditions. The transducer is also stabilized to provide constant contact with the target even when the vessel is pitching in bad weather.

The hull unit has been designed to fit the smallest of professional fishing vessels and is quite light compared with its rugged construction.

Weights:  
Hull unit : 155 kg  
Cabinet : 25 kg  
Transceiver : 15 kg



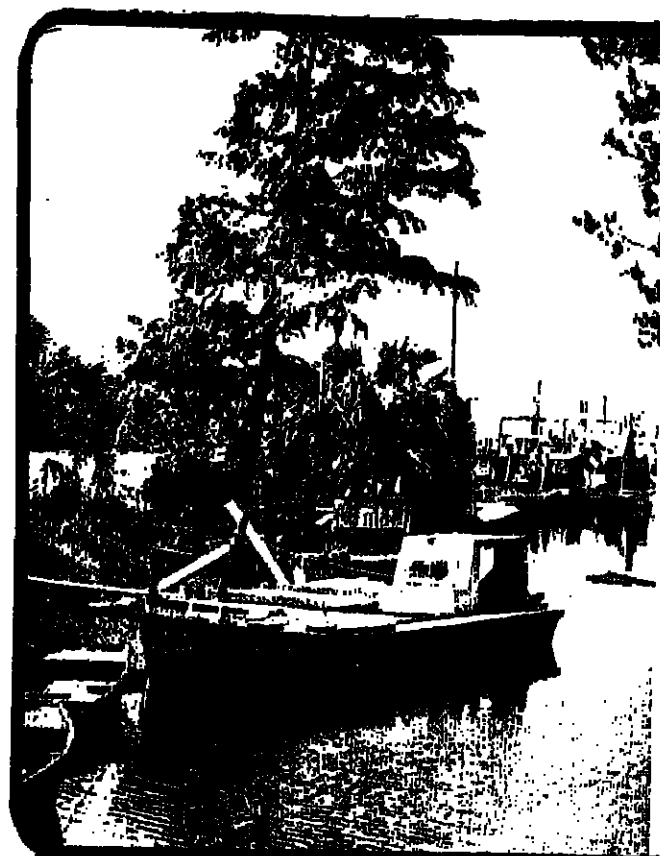
To be seen at Nor-Fishing '78, stand no. 231. hall E

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P.O. Box 111, N-3191 Horten, Norway.

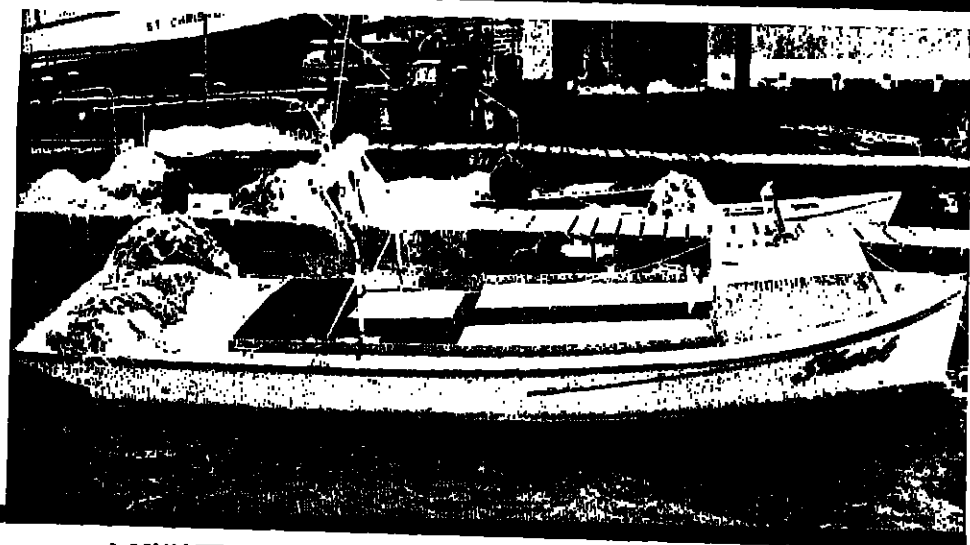
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# SIMRAD





OYSTER SKIFFS used for tonging.

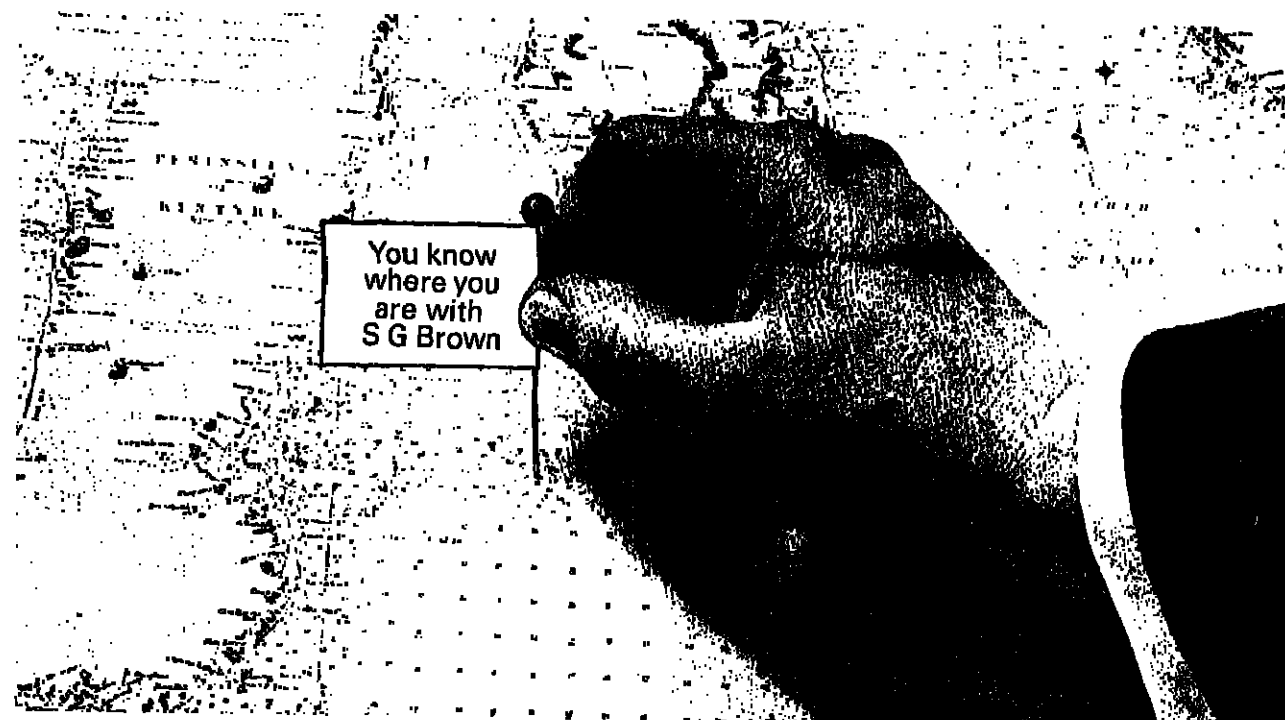


A MULLET and trout gill net skiff awaits her crew for a night trip.

# Small is big

**SKIFFS  
BRING  
HOME A  
VITAL  
CATCH**

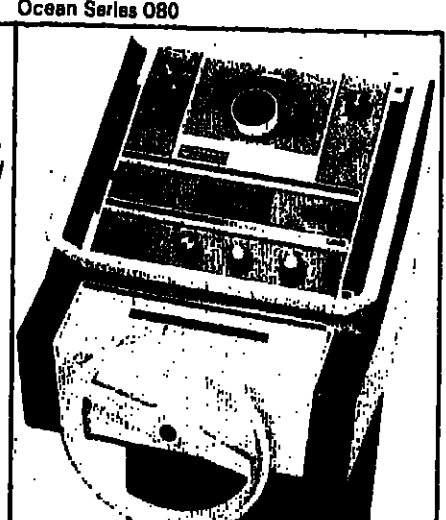
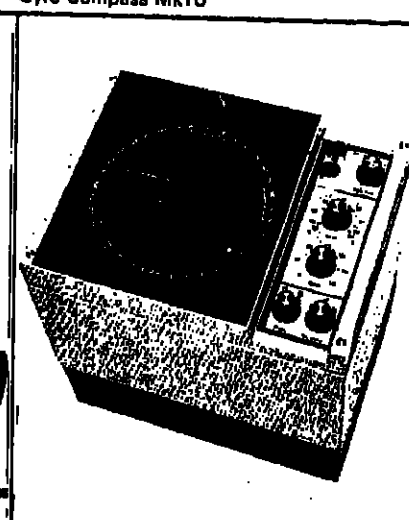
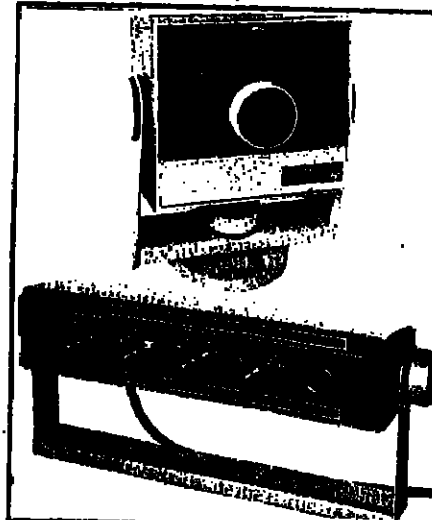
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## FOR SOUTHERN

MENTION the Gulf of Mexico fisheries and the immediate image is of high-capacity shrimp trawlers, advanced technology and large processing plants. But the United States Gulf coast is also the base area for some important small-scale fisheries, described here by JEFFREY A. FISHER.

FOR A LONG time, the small-boat fisheries of the Gulf of Mexico have been making a substantial contribution to the local economies of southern United States fishing communities.

These fisheries have never attracted attention like the traditional large-scale operations for shrimp, lobster, and bottom fish. They include catching of oysters, blue crabs, mullet and sea trout. Small-boat fisheries in the areas are conducted from skiffs 4.8 to 8 metres long. The boats are powered mostly with outboard motors of 20ft. 75 h.p. Some have inboard petrol engines; a few have small diesels.

Designs of skiffs around the Gulf vary. Usually flat bottom, wood boats with a

shallow draft, they are meant for inshore protected waters. Black mullet and speckled sea trout are taken by the same fishing unit. The catch method is a shallow (2 to 4 m) gill net, ranging from 300 to 600 metres in length.

### Bayous

The fishing is done almost entirely in bays, bayous, estuaries, river mouths, inlets, etc., and most of the catches are taken in spring (March-May) and autumn (September-November).

The five-year average (1972-1976) for total US landings of mullet is about 15,400 metric tons (33.9 million US lb). In 1977, landings dropped by one-third to less than 10,000 tonnes (22 million US lb). From 1976 to 1977, landings

## FISH... AT THE DROP OF A REEF!

ACCORDING to a report in the *Financial Times*, Japan is spending the equivalent of \$200 million on a seven-year programme to develop and install artificial fishing reefs in the waters within its 200-mile fishing zone.

Participating companies hope eventually to export the technology (and the products) used to build the reefs. But the big aim of the project is to aid local fishermen by increasing the number of fish in Japanese waters.

The establishment of her 200-mile zone gave Japan a very large exclusive fishing area. But it was producing almost all that it could with conventional fishing methods.

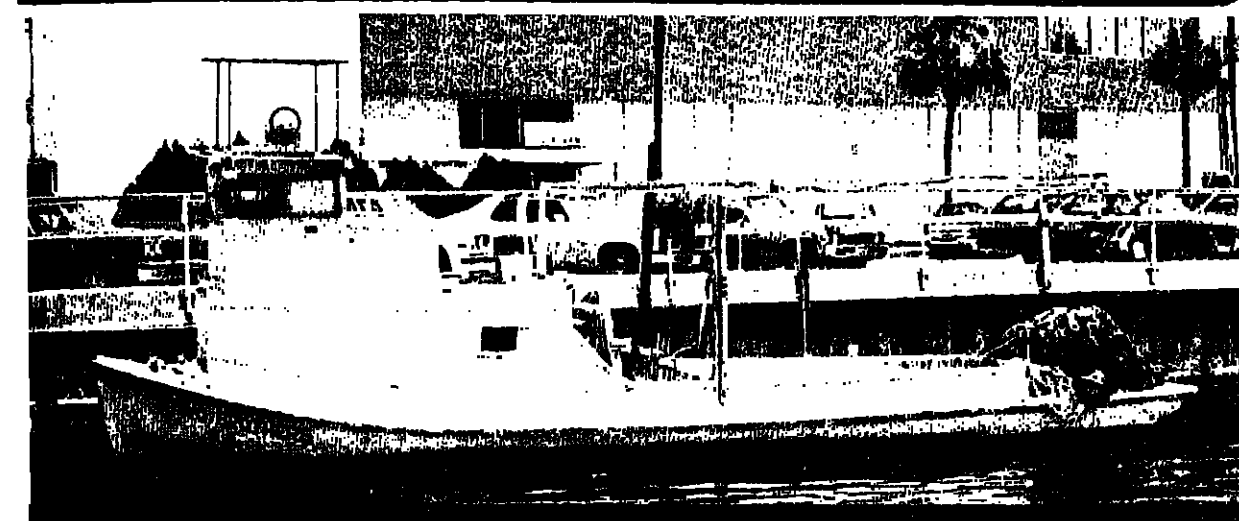
Building artificial reefs to attract fish is neither particularly new nor original to the Japanese. However, they believe they are the only country putting the idea to practical use.

So far, 16 designs have been produced by 18 companies and research institutes. All are designed to last 20 to 30 years after being dumped in the oceans.

They range from a 7 metre high by 8 m. wide triangular cement structure from ship and heavy machinery builder, Ishikawajima-Harima Heavy Industries, to an aggregation of 15 used automobile tyres produced by Bridgestone tyre company. A small cement form shaped like a turtle with holes was designed by Turtle Marine Engineering Development.

Typically, the reef structures are made of cement or a combination of cement and plastic. So far, artificial reef structures have been dropped in about 100 locations off the coasts of Japan.

# in the Gulf



THIS TYPICAL beach seine skiff's built-up fore deck enables her skipper to see the fish.



TYPICAL CATCH of black mullet from one skiff.

## UNITED STATES

value decreased from \$4.5 to \$4 million. This decline was due to the 33 per cent drop in volume.

In recent years, dockside prices have been increasing. As late as 1972, prices were always about 10 cents a lb or less.

In 1973, ex-vessel prices jumped two to five cents depending on area. In 1977, the price approached 20 cents. There are two reasons for this doubling in four years. First, landings have declined as noted. Second, black mullet roe is prized by the Japanese. Thus a new export market has developed.

Speckled or spotted sea trout represent a "second catch" of the mullet fishery. The US 1972-1976 average annual catch was 3.5 million kilos. Since 1971, the dockside price has not gone below 30 cents a lb. Recently, prices in the range 45 to 60 cents have been common.

Since trout landings are not very great, the fish seldom reaches markets beyond the US Gulf and Atlantic Coast. The principal outlets for both speckled trout and mullet are restaurants and household consumers, as drawn, dressed or fillets. There is generally no further processing or packaging.

Oysters are harvested in two ways. Manual tongs three to five metres long are used to rake and pull oysters off the bar. In some areas, small dredges are towed over a bar. The Gulf dredges are approximately one metre wide, possessing a chain and nylon bag. The rake of the dredge has teeth to pull oysters off the bar.

### Bushels

Oysters are marketed in the shell by the bushel (local volume varies) and already shucked meats in pints (0.47 litres) and gallons (3.8 litres).

While trout and mullet are uniquely from southern waters in commercial quantities, oysters are harvested throughout both coastal ranges of the United States.

Average US oyster landings (1972-76) were 52 million lb. (22,900 tonnes), shucked meats. In 1977 landings were 46 million lb. In that same year, the average dockside

price was \$1.14/lb. oyster meat.

In the Gulf of Mexico, only hard-shell bluecrabs are landed in quantity. The techniques and values of a soft shell crab industry are not well known in the Gulf.

Some blue crabs enter the US market channels as a by-catch from shrimp trawling.

The primary harvest method is trapping. One or two men operate a trapline. The traps are baited with fish heads and racks, buoyed on individual lines, and made of galvanized or plastic coated wire. Trap dimensions are approximately 60 cm x 60 cm x 45 cm. Peak production is between May and September.

### Landings

The five-year US average landings (1972-76) of hard blue crabs was 60,000 tonnes (134 million lb.). In 1976, dockside price was 23 cents/lb.; in 1977 it was 21 cents/lb. Prices are for whole animal, not picked meat.

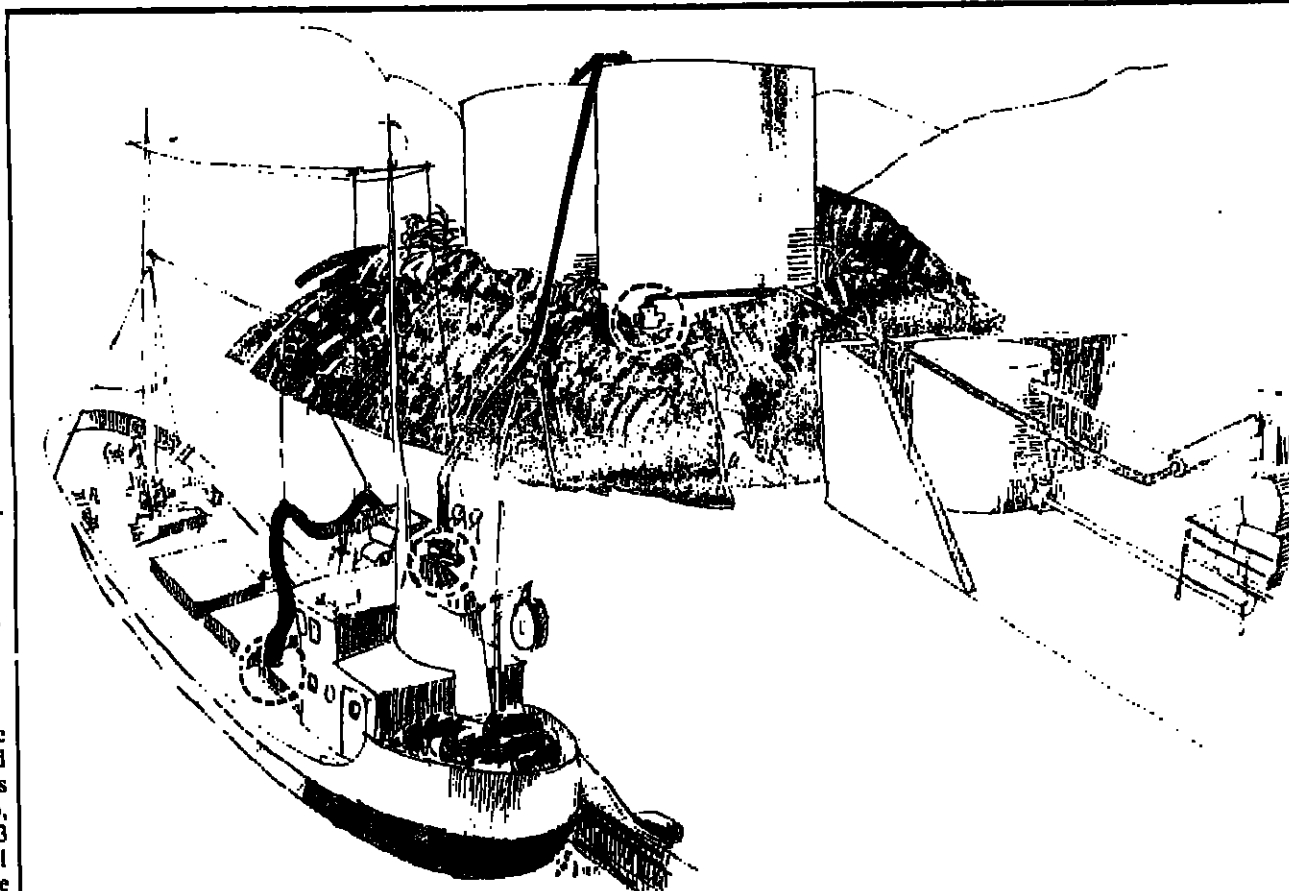
In certain geographical areas, other small boat fisheries are extremely important. These include eels, bay scallops, flounders, stone crabs, and "beach fish." Beach fish in the Gulf primarily means pompano and cigar fish.

There is at least one fishery that doesn't classify well in terms of boat size. This is the mackerel fishery. King and Spanish mackerel are the main resources. Fishing methods, investment, costs and returns differ between the two.

A bona fide small boat portion of the Spanish mackerel fishery exists. These boats are approximately five, to six metres long, of glassfibre construction, and powered by petrol engines of 100 to 250 horsepower. They hold from 1,100 to 2,700 kg of fish.

Spanish mackerel on these boats are taken with deep gill nets of various size meshes. Each boat carries several nets (sometimes up to 12) for different conditions. A crew of one to two operate less than 250 boats. All boats fish for other resources at certain times of the year.

The five-year average annual landing for Spanish mackerel in the US was 5,042 tonnes.



## MYREN MAKE THE FISH "DRY-SWIM" RIGHT INTO THE FACTORY

Mess, Smell, Wastage.

Inefficiency. Much has been said on the subject of transport of raw materials in the fish meal industry, and rightly too. Throughout the years this transport has taken place in open systems, e.g. grabs, bucket elevators etc. Mess, smell wastage and unpleasant working conditions were the result.

A closed pipe system for the discharging and internal transport of the raw materials solves these problems at one stroke. But in order to make such a system work, Myren's engineers had to solve another problem: the pump did not exist that was tough and robust enough for such a job.

We therefore designed the BRP pump. With this we could at long last employ piped transport to solve the fish meal industry's problems. By means of a special "pipe-lubricating system" we made it possible to pump long distances without the addition of ordinary transport water, and without loss of raw materials.

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## FOCUS ON SOUTH PACIFIC FISHERIES...

# Papua puts accent on skipjack boost

PAPUA NEW GUINEA has formulated a new fisheries policy which will give the national government, and not individual provincial governments, control over the fish resources of the country. But provincial fishery councils and a national advisory board will be constituted to encourage co-operation between national and provincial governments.

With the recent declaration of a 200-mile economic zone, Papua New Guinea has control over some 700,000 square miles of sea. The potential skipjack tuna and billfish catch in this area is estimated at around 100,000 tons a year. The government's long-term policy is for the PNG tuna and other fish stocks to be taken by a national fleet and to have most of the tuna processed locally in government joint venture projects with foreign investors.

It is planning a fleet capable of fully exploiting tuna resources in the EEZ within ten years. To help achieve this, the government is negotiating with the Asian Development Bank for funds to acquire the first eight to ten vessels.

In the meantime, foreign vessels are being allowed to work PNG waters on payment of a licence fee each year, and a levy on the fish caught but not processed in PNG.

on Manus Island and will process skipjack for export and for domestic consumption. The ownership arrangement is interesting.

Initially it will be 40 per cent Starkist, 40 per cent PNG government and 20 per cent World Bank. Eventually the PNG government will buy out the World Bank's share and thus gain the controlling interest.

### Tentative

Tentative plans are also reported for further processing plants on New Ireland, East New Britain.

Full exploitation of the big tuna resource is expected to have a considerable impact on the PNG economy. The government has therefore given fishery projects high priority in its recent review of individual industry policies.

It will, for example, finance half the cost of carrying out feasibility studies in the fishery industry.

## New agency?

PAPUA NEW GUINEA has one of the major fishery industries among the vast spread of islands and micro-states in the South Pacific region.

It has, therefore, been keenly interested in the attempt over the past year to set up a South Pacific Regional Fisheries Agency. This would co-ordinate licensing, surveillance and conservation of marine resources for countries which, individually, might find it impossible to carry out such work.

The work of establishing the Agency is being done by the South Pacific Forum. In addition to Papua New Guinea, its members include Fiji, Tonga, Western Samoa, Solomon Islands, Nauru, Niue, Cook Islands, Gilbert Islands, and Tuvalu. The last named is the latest of the independent states; formerly the Ellice Islands.

Together, the members of the South Pacific Forum control more than six million square miles of ocean, and this includes some of the best remaining areas for tuna.

When it met in Niue in September, the South Pacific Forum decided to go ahead with the fisheries agency. But there are difficulties over membership of the United States, whose policy towards tuna in the high seas conflicts with that of the South Pacific countries.

One of the island groups, American Samoa, is an unincorporated territory of the United States.

	Population (1977)	Land Area (km <sup>2</sup> )	EEZ Area (000 km <sup>2</sup> )	Area per head (km <sup>2</sup> )
American Samoa	50 000	197	410	13
Cook Islands	18 000	240	2 200	118
Fiji	582 000	18 200	1 370	8
French Polynesia	127 000	4 000	5 250	40
Gilbert Islands	52 000	684	4 430	83
Nauru	7 000	20	290	40
New Caledonia	134 000	19 100	1 040	11
New Hebrides	98 000	11 480	870	32
Niue	3 000	260	380	127
Norfolk Island	1 000	35	370	300
Papua New Guinea	2 908 000	461 682	2 300	1
Pitcairn Island	68	4	970	1 455
Solomon Islands	208 000	28 800	1 630	8
Tokelau	1 000	10	330	300
Tonga	60 000	697	720	12
Trust Territory of the Pacific Islands (incl. Guam)	218 000	1 800	7 480	34
Tuvalu	7 000	25	760	103
Wallis and Futuna	9 700	18	280	29
Western Samoa	102 000	2 904	180	2

This table from the July, 1978, Fisheries Newsletter of the South Pacific Commission includes the island states engaged in setting up a regional fisheries agency. It shows populations, land areas, approximate sizes of the 200-mile economic zones, and their area per head.

## Tagging along with the tuna...

THE THREE-YEAR South Pacific skipjack tagging programme, which began in October, 1977, has been going remarkably well. By the end of June, 1978, the programme's vessel had tagged 43,000 skipjack and other oceanic tunas. This exceeded the target for the whole year by more than 13,000. And it included the release of 2,985 tagged skipjack in one day.

By early September, some 1,000 captures of tagged fish had been reported, including five international recoveries.

### Distant swimmers

One fish tagged in Fiji waters on February 28 was caught off Queen Salote pier in the Kingdom of Tonga on July 15, having travelled some 500 km.

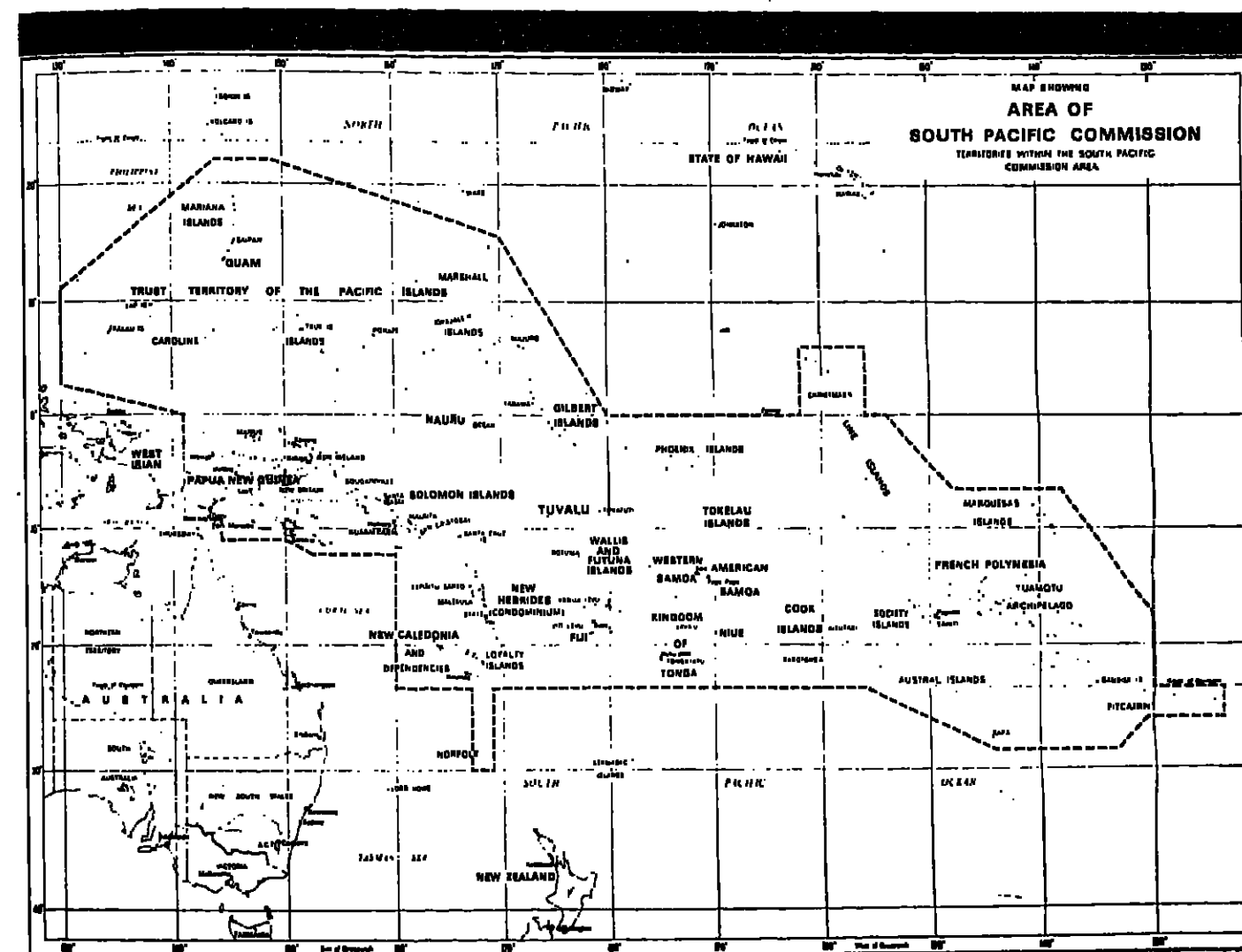
Another skipjack tagged in Tongan waters in April was caught six weeks later 600 km away in Samoan waters.

The tagging programme is being supported by six countries interested in the skipjack industry.

Apart from actual tagging, the research team carried out a survey of live bait resources in all territories within the aegis of the South Pacific Commission. (See map).

The vessel used in the programme is the *Hatsutori Maru*, a 35.4 metre long chartered pole and line boat. She has five live bait wells with a combined tank capacity of 74.6 cubic metres.

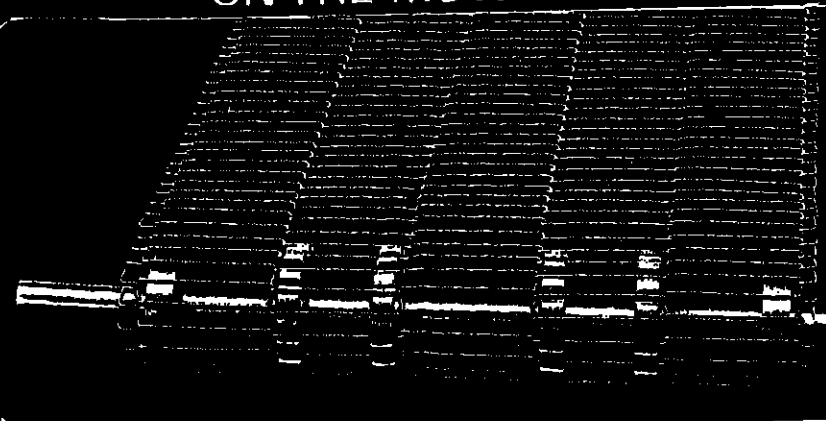
Co-ordinator of the programme is Dr. Robert Kearney.



## The area

THIS MAP of the South Pacific Commission area shows the island countries that will be involved in the proposed regional fisheries agency. The South Pacific Commission is a consultative and advisory body set up in 1947 by the six governments then responsible for the administration of the island territories in the region. Many island states joined the Commission as they gained independence.

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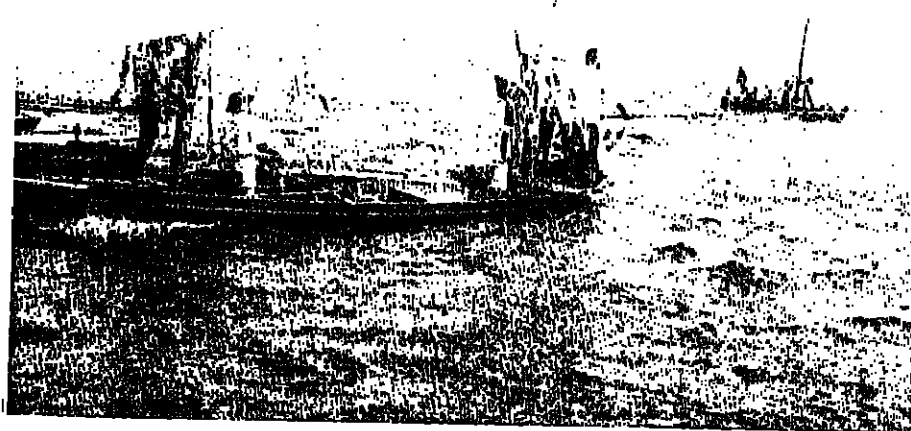
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## Technical aid for a coral paradise

# MALDIVES

ICELAND is not the only small island country that relies on fish for most of its export earnings. As our Pakistan correspondent S. RASHID ALI shows in this article, fishing is a vital industry in the tiny Republic of Maldives, and provides 97 per cent of exports.



Clean blue skies and a promising sea... fishing from small sailing boats for skipjack in the Maldives.

MALDIVES is the smallest independent country in Asia and one of the smallest in the world. It consists of 1,196 coral islands divided into 19 atolls and lies about 400 miles south-west of Colombo, Sri Lanka.

The population is about 150,000.

White sandy beaches and clear blue skies endow the scenery of the islands with a rare beauty. Life there is simple, and the islands are attractive to visitors who enjoy swimming, deep-sea fishing, skin diving, boating and shell collecting.

The islands of the Republic spread over a wide area and, with its new 200-mile economic zone, it claims a sea area about ten times that of the land. It is not surprising therefore to find that fishing is by far the most developed sector of the Maldivian economy. Between 80 and 90 per cent of the population is engaged in one way or another in this industry.

### Outside

But the total catch is still just over 30,000 tons a year and earnings from fishing are not enough to capitalise further development and necessary modernisation.

For this reason, the Maldivian government has been looking outside for aid and technical assistance. Since 1971, this has come from the UN Development Programme/FAO, and from

such countries as Japan, Iran, India, Korea, Kuwait and Thailand.

The islands depended on Sri Lanka as an outlet for dried/salted fish until the Japanese and Thailand companies began buying directly from the fishermen, paying cash for it. This is gaining popularity for the simple reason that it saves much labour and time. Normally, processing of Maldivian fish takes about three to four weeks.

### Approval

No foreign boats, including those of the Japanese and Bangkok companies, are allowed to fish within the Maldivian 200-mile zone without approval from the government.

Apart from the direct sales, marine products exported include frozen tuna and skipjack, some varieties of frozen white fish, dried reef fish, dry salted fish, some mackerel, shark meat and fins, tortoise shells, red coral, cowries and ambergris.

Total exports in 1977 amounted to 10,200 metric tons. Of this amount, just over 85 per cent comprised frozen skipjack and tuna.

The export of dry salted fish to Sri Lanka was resumed in 1973 and has been gaining

# A micro country seeking a macro fishery

popularity among private traders. Growth of outlets in Singapore has stimulated the export of tortoise shells and sharkfins.

In mid-1977, the 21,000 fishermen in Maldives operated 5,400 boats — 2,100 of them the pole and line mas dhonies and 3,400 the trolling vadhu dhonies. Almost all of these are traditional sailing boats built out of coconut timber. Less than 400 are motorised.

But this is what the government is seeking, to give flexibility to the catching fleet and to help it to make better use of offshore stocks and raise the catch from its present total of 30,000 to 40,000 tons a year.

### Two seasons

Waters around the islands are rich in species such as tunas and the frigate mackerel. There are usually two seasons, although these vary considerably between atolls and even islands.

Small boats and lack of engines also contain the fishing effort within about 60 miles from the shore and to the surface waters. But the time has come for the Maldivian fishermen to think of more efficient methods and

to use bigger boats and trawlers for deep-sea catching.

The Maldivian government has been giving serious thought to these possibilities and it is being helped by advice from international bodies such as FAO and bilateral agencies.

### Into zone

It is also having to deal with the problem of foreign intrusion into its 200-mile economic zone. The government has made several attempts to check encroachment by foreign vessels by notifying the countries in which they are registered.

But this seems to have had little effect, judging by the number of foreign vessels spotted in different parts of the Maldives. In many cases, the boats seem to come into the economic zone when they run short of bait fish.

Dynamite has been used to kill fish around the reefs and this devastates whole areas.

Faced with this problem, the government is being compelled to consider more active preventive measures, including patrolling its economic zone with special ships and with aircraft.

## BAADER

Continued from page 23.

This machine's rotating knife belt also allows greater working width and a faster fillet sequence.

### No loss

But in the Baader 51, the skin is removed by a stationary knife. The initial cut for the knife to grip the fillet and so start the skinning is no longer necessary, thus eliminating this meat loss.

The machine can work on several fillets at once. It can skin 150 fillets a minute, depending on the skill and number of operators, and it yields a high quality product.

Through the improved efficiency and larger working width of the 51 skinner, it has been found possible, through small alterations to the fillet delivery belts, to work machines such as the Baader 150, 181, 189 or 190, on only one skinner, instead of the two 47s usual until now.

The skinner is silent in operation. It will maintain the Baader reputation for high quality materials and for long and useful life.

## SRI LANKA WELCOMES HOME THE FISH

A BUSY beach on the southern coast of Sri Lanka. The many outboard motors on these small boats indicate the extent to which fishing in the area is becoming motorised.



SRI LANKA'S fishing industry is returning to normal after a period of scarcity and soaring prices.

FNI correspondent Nalin Wijesekere reports that on the southern coast Galle brought in a harvest of more than 100,000 lb in a recent spell of good fishing. This is the best result in about ten years and helped bring down the retail price of fresh fish.

One result of this good fishing has been better use of Galle harbour. For example, the trawler *Beruwela* came

into harbour with a catch of 65 tons taken on a 15-day trip.

On the east coast, Trincomalee has been getting big landings of catfish and horse mackerel. The fishing season there begins in March and continues to as late as December although the migrant fishermen usually leave before the beginning of the rainy season in October. But this year they left early and so

local fishermen have been getting unprecedented harvests.

The Negombo and Kalpitiya areas along the west coast have been busy as outriggers and beach seine boats bring in big catches.

Large amounts of herring and yellowfin tuna are also being caught. The Ceylon Fisheries Corporation can-

nery in Pesali—virtually idle for a long time — has been getting ready to pack catches surplus to market needs.

With the improvement in supplies, fish prices have been coming down from the peaks of a few months ago. And fishermen's earnings, where catching has been good, have gone up to around Rs1000 (£34) a week.

## IF YOU THINK THIS PROPELLER IS READY FOR THE DUMP -YOU'RE WRONG!



Another good reason for choosing Multi Pitch is the unique controlled pitch propeller blades, which provide both maximum speed and maximum power in the same propeller unit. This is the perfect combination for fishing vessels, freighters and tugs.

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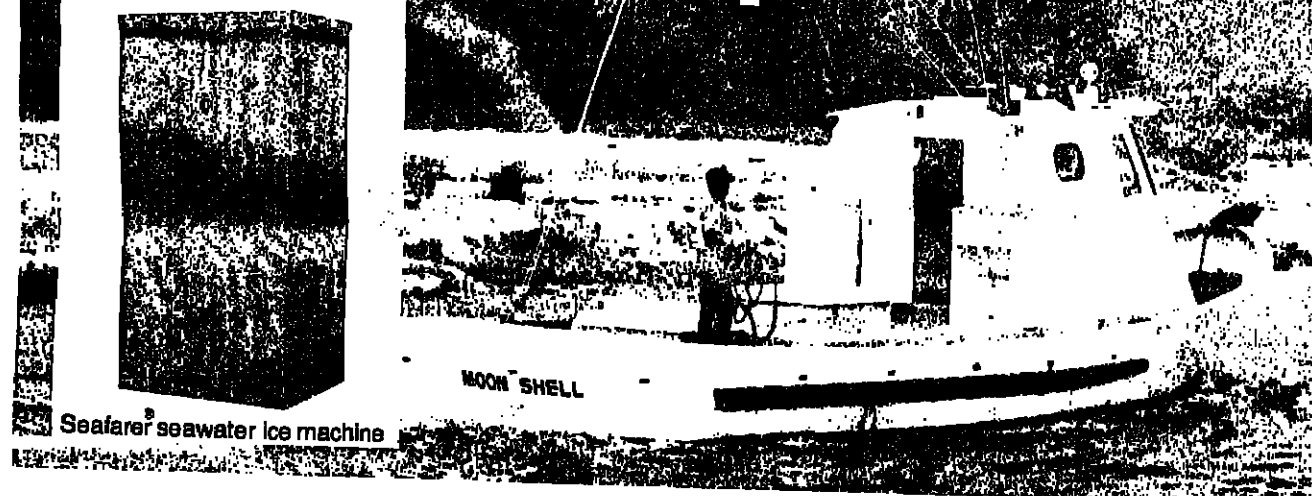
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## Fishing for increased profits?



Seafarer seawater ice machine

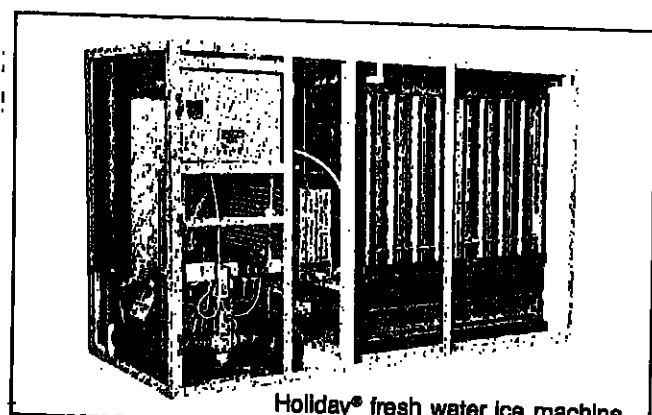
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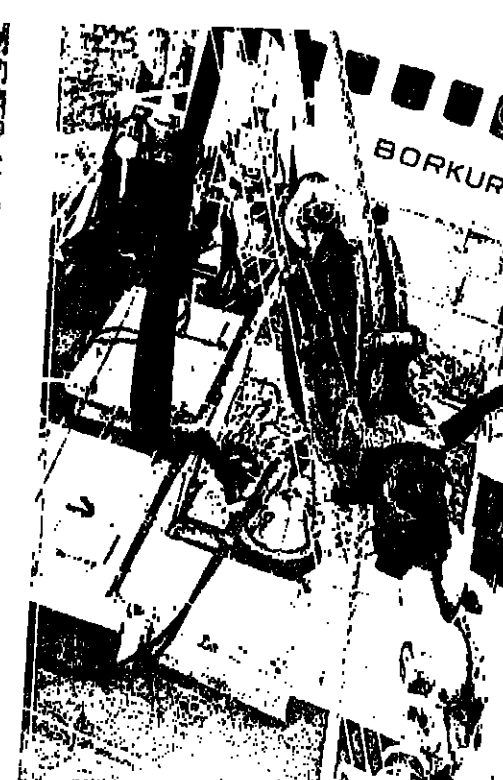
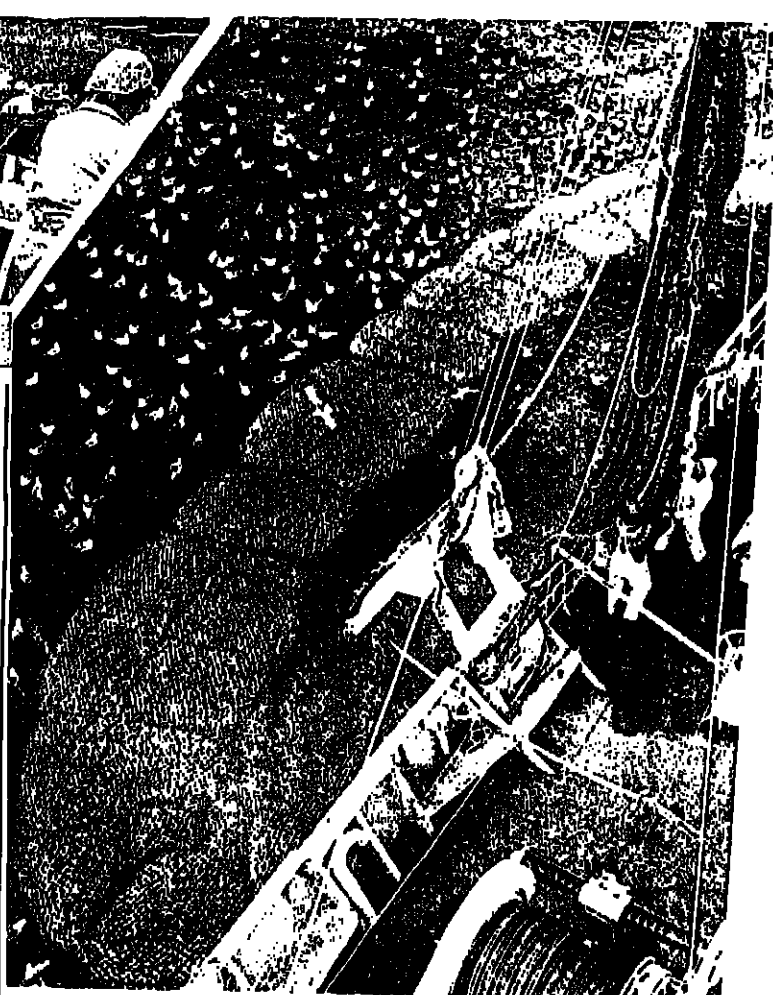
Technical aid helps improve designs. This modified skipjack boat was developed with the assistance of FAO naval architect John Fyson.



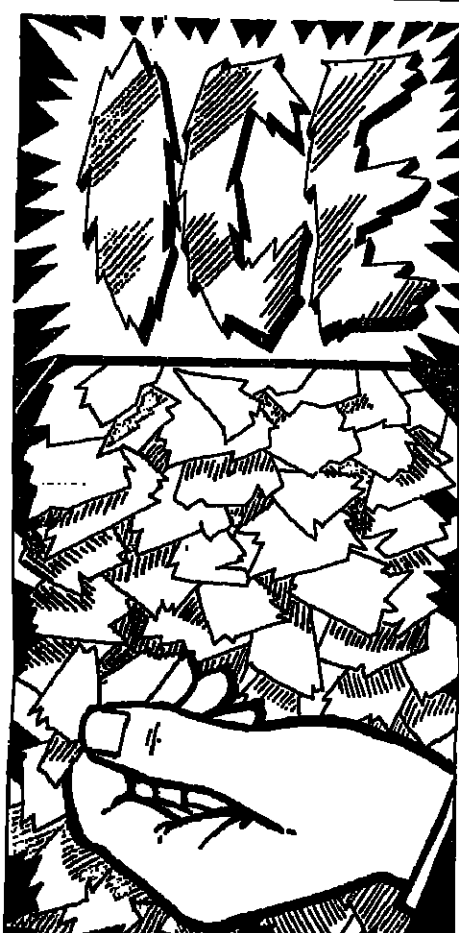
Maldivian fishermen with part of the day's haul of skipjack. Tunas make up the bulk of fish exports from the islands.



# ICELAND



Top left: Weighing and packing fillets in an Icelandic factory.  
Above: At sea, and a huge catch of blue whiting comes aboard. Attempts have been made to process this fish for the US market but with little success so far.



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## Foot in the door at Reykjavik

**BMEC**  
forum

**THE FIRST** ever co-ordinated attack by a group of British marine equipment manufacturers on the Icelandic fishing market was staged at a Reykjavik hotel last month.

Nineteen firms took part in a Mini Exhibition organised by the Fishing Division of the British Marine Equipment Council (BMEC) and supported by the British Overseas Trade Board.

They presented a wide range of products from lifejackets to propulsion systems, marine radar and refrigeration equipment.

Fishing News International was there too, along with sister papers Fishing News and Fish Farming International.

The only boatbuilder to attend was Campbeltown Shipyard which had been invited as a non-member of BMEC.

### Special interest

The Scottish yard has a special interest in the Icelandic market, having only recently sold four of its new 87 ft. compact stern trawlers to Faroese owners.

In addition to taking stand space, 11 firms gave papers at a technical Fishing Forum which ran concurrently with the show.

About 300 representatives from the Icelandic fishing industry attended.

They included shipbuilders, vessel owners, fishermen, and personnel from the freezing

plants, marine institute and fisheries ministry.

But for many of the British who travelled to Reykjavik, the exhibition will be remembered not so much for its immediate results as for its providing a unique and valuable opportunity to get a foot in the door of a totally new market.

Speaking at the opening ceremony at the Hotel Loftleidir, Mr. Jon Arnalds, Secretary General for the Ministry of Fisheries, said that "past disputes have sometimes overshadowed co-operation; but this is over forever."

With memories of the Cod War fading, Iceland could be looking,

more than ever before, to Britain for the gear and equipment she needs to maintain her freezing plants and powerful fleet of modern fishing ships.

There are already signs of a possible resurgence of new trawler building — all be it on a replacement basis.

In the long-term, therefore, the timing of the BMEC venture could well prove opportune, despite its having taken place at the time of economic uncertainty in Iceland.

BMEC Fisheries Division is already taking provisional bookings for a trade mission to India in April next year.



Inside the mini exhibition at Reykjavik.

# INSIDE HER LIMITS

**DAVID GLEN looks at how Iceland's fishing industry has fared in the three years since she declared a 200-mile zone.**

IT IS JUST three years since Iceland declared an exclusive 200-mile fishing limit and fought for it in one of the bitterest "cod wars" of them all.

She took on Britain's government, her navy and her fishing industry, and won.

But that's all over. The last British trawler in Icelandic waters has long since hauled her gear and disappeared, hull down, over the horizon.

Today, British manufacturers of fishing gear and equipment are seeking a greater share of the Icelandic market; and the Icelanders are looking to the time when Britain will be second only to the United States as a major outlet for frozen fish.

Even that dogged fraternity, the 'lumpers' of Grimsby, have at last removed their long-standing ban on unloading of Icelandic fishing vessels at the east-coast port.

Past hostilities are being forgotten and new friendships forged.

So how has Iceland fared since that eventful day of October 15, 1975, when she became the first European fishing nation to declare an exclusive 200-mile zone?

Firstly, her cod catch has increased markedly: A combination of careful conservation measures, good year classes and the departure of foreign trawlers has pushed cod landings from 266,000 tons in 1975 to 330,000 tons last year.

The haddock catch — seemingly affected by a five-year cycle — was 24 per cent up in the first five months of this year. Overall 1977 haddock landings were 35,000 tons.

The total groundfish catch — which includes saithe, ling, ocean catfish and redfish — has increased from 439,000 tons to 489,000 tons over the three years.

In the pelagic sector, herring is showing encouraging signs of revival, especially in the south-east. This year's quota has been stepped up from 25,000 tons to 35,000 tons.

But it is capelin that has shown the most dramatic improvement of all, thanks to the discovery two years ago of a totally new summer fishery.

In 1976 the catch was 459,000 tons; last year it was 809,000 tons, and predictions this year are that it will top 900,000 tons.

The second major development for Iceland has been a healthy upturn in the market for frozen fish.

After a period of depression, prices of fillets and blocks on the US market rose sharply by the end of 1976. There were further increases in 1977 and prices now look like levelling off at a new high.

The United States, by far Iceland's biggest customer, took 67,000 tons last year, compared with 63,000 tons in 1976. And, with a recent big expansion in Iceland's US-based freezing and processing facilities, further growth in the market there seems assured.

Figures from Coldwater Seafood Corporation, the US subsidiary of Icelandic Freezing Plants Corporation, show uninterrupted growth since 1973.

In 1975 their sales topped \$100m; the following year they reached \$145m and last year \$174m. This year's projection is that they will exceed the \$200 million mark.

The signing of the Oslo agreement in 1976 has settled a bitter tariff dispute with the EEC and opened up new trade opportunities with the European Community.

Frozen fish exports to Britain doubled last year, and there are hopes for another increase in 1978.

On other fronts, a new market has recently been opened up for stockfish in Nigeria, and Portugal is to import salt fish in exchange for oil.

Thus, with increased supplies, higher prices and an improvement in the volume of exports, Iceland's fish producers look set for a new upturn in their fortunes.

The stern trawler fleet is, for the first time, producing more than half of total landings, and the government is sensibly putting the breaks on further expansion.

Supplies are improving, and except in the south-west,

where landings continue to be sporadic, the freezing plants have swung into full production, working a ten hour day, five to six days a week.

They have now reached a break-even situation, and an IFPC spokesman last month, but they could easily be pushed back into the red.

Iceland's economy continues to be precariously supported by a single major industry.

The nation, accustomed to a very high standard of living, makes enormous demands on it while appearing to be blind to its vulnerabilities.

Devaluation follows devaluation in a seemingly endless succession.

And inflation, running at between 50 and 60 per cent, is causing real problems.

The future strategy of the new fisheries minister, Kjaran Johannsson, a Social Democratic and a technocrat, is still something of a mystery.

Industrial unrest continues. The seamen's union has lodged demands for pay increases up to 30 per cent to bring them into line with general workers.

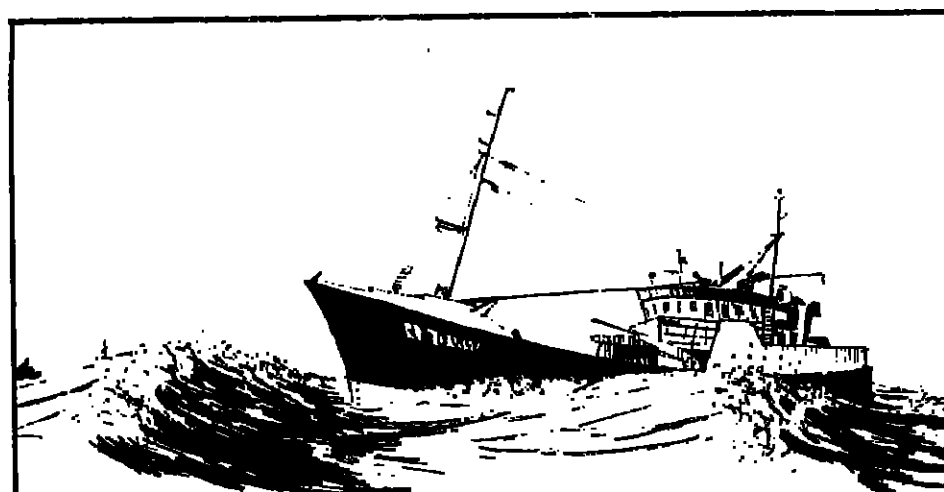
Pressure on vessel owners is likely to force up quayside prices, which are fixed by committee in Iceland, to a level where the freezing plants could once more fall into debt.

In a few years, Iceland has secured her fish stocks from foreign exploitation and she has established secure markets around the world for upgraded fish and fish products.

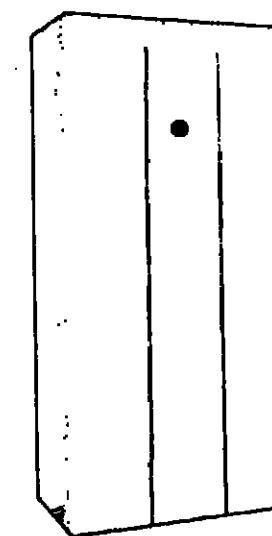
It remains to be seen whether she can so easily solve those of her problems that arise from within.



▲ Weighing and boxing at sea. All fish is stored in this way aboard Icelandic stern trawlers.



## Make your own ice and freeze one cost of fishing



Now you can make your own ice with a Seafarer sea water ice making machine. Sea water ice costs less because you make it as you need it, when you need it. So you'll never have to return to port just for the lack of ice. When you do return, your catch could command better prices because Seafarer sea water ice keeps your catch, colder, fresher, odourless and brighter in colour. Sea water ice is softer and doesn't freeze to itself on your catch with no sharp edges to scar, tear or bruise. So it cushions your catch as well as your pocket. Ask for details at any Cosalt branch or write direct to the address below.

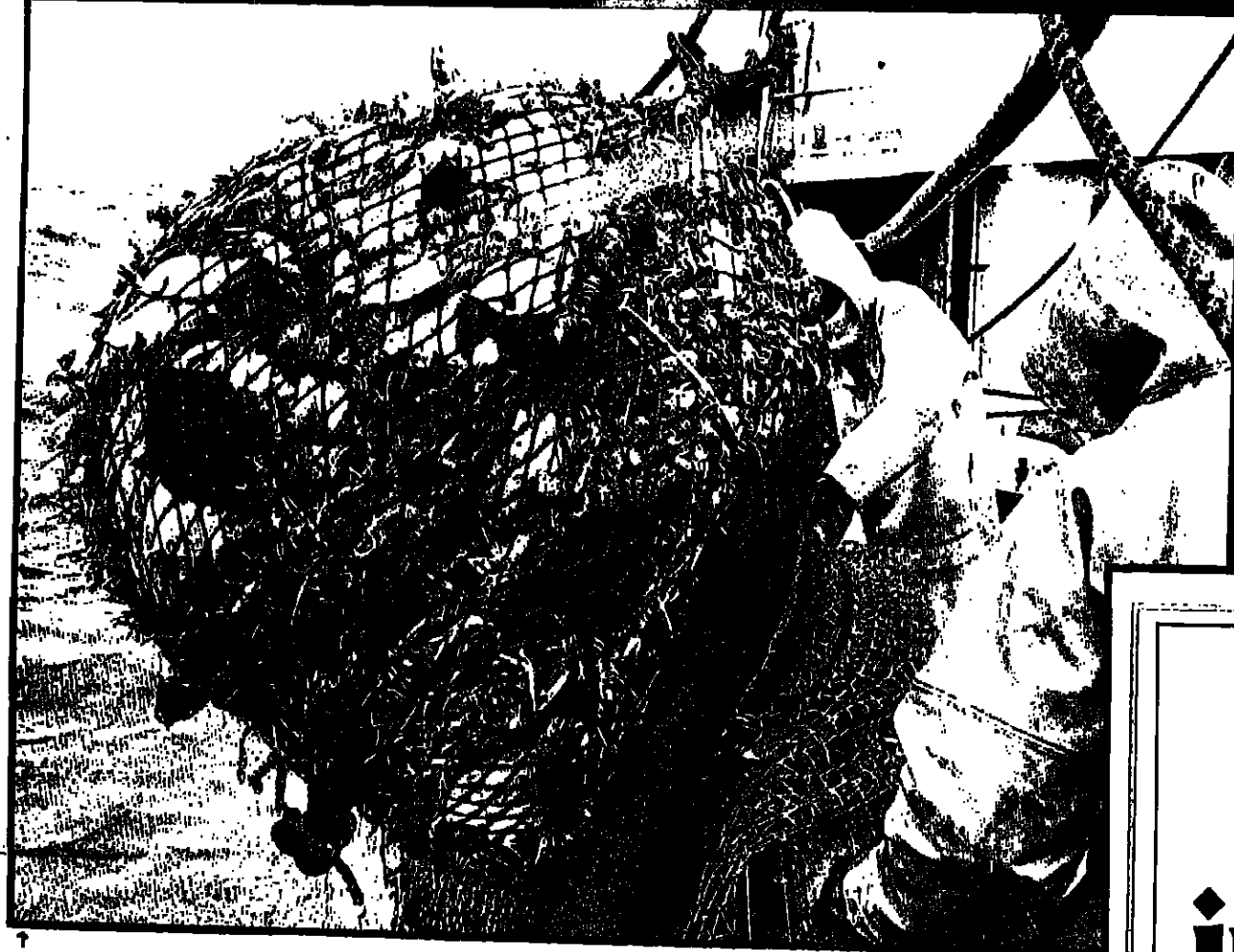
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**NEXT MONTH: report on a big, new freezing plant**



# ICELAND IN FOCUS

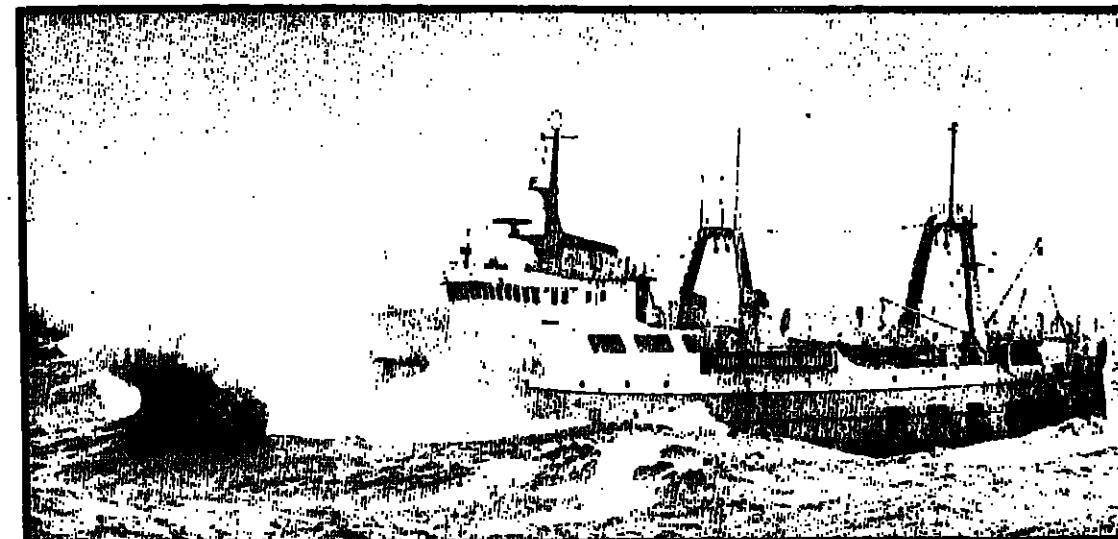


Iceland's fishing industry provides 74 per cent of its exportable goods and employs around 5,000 people.

1. A large catch is brought ashore. The crew will be the lobster fishers.

2. Gutting line below decks is cod.

3. An Icelandic trawler puts her way through the seas. There are about 100 such ships in the fleet.



**The camera turns on aspects of the fishing industry and on some of the many people who live by it**

4. Ashore, a catch is passed through a Baader nobbing machine.
5. Cartoning frozen blocks down in the freezing room.
6. Girls prepare Icelandic lobster, or 'nephrops'. Only the tails are eaten.
7. Quality is vital. This girl may lose bonus if her trimmed fillets are below standard.



**PICTURES: Icelandic Freezing Plants Corporation**

## A breakthrough in video processing

**-now gives brighter, clearer echoes on a clutter-free screen.**

With ordinary radar there are six fundamental problems that can hinder the interpretation of a radar picture — **Sea clutter**, which can best be dealt with by manual adjustment of the sea clutter controls; **Rain clutter**, dealt with by manual adjustment of 'rain' and 'sea clutter' and 'gain' controls. (These controls require constant skilled adjustment, sometimes over long periods, and provide at best a compromise solution.) **Radar interference** from other ships and **receiver noise** from own ship also worsen the picture. **Weak echoes** are hard to pick out and **small echoes** even harder to see at long range.

But now Decca CLEARSCAN radar solves these problems with unrivalled picture clarity.

**Sea clutter** is suppressed by automatic adaptive control of the Sea Clutter Control.

**The rain clutter** is suppressed by automatic adaptive control of both the rain and sea clutter controls, and gain level.

**Radar interference** is suppressed by automatic circuits.

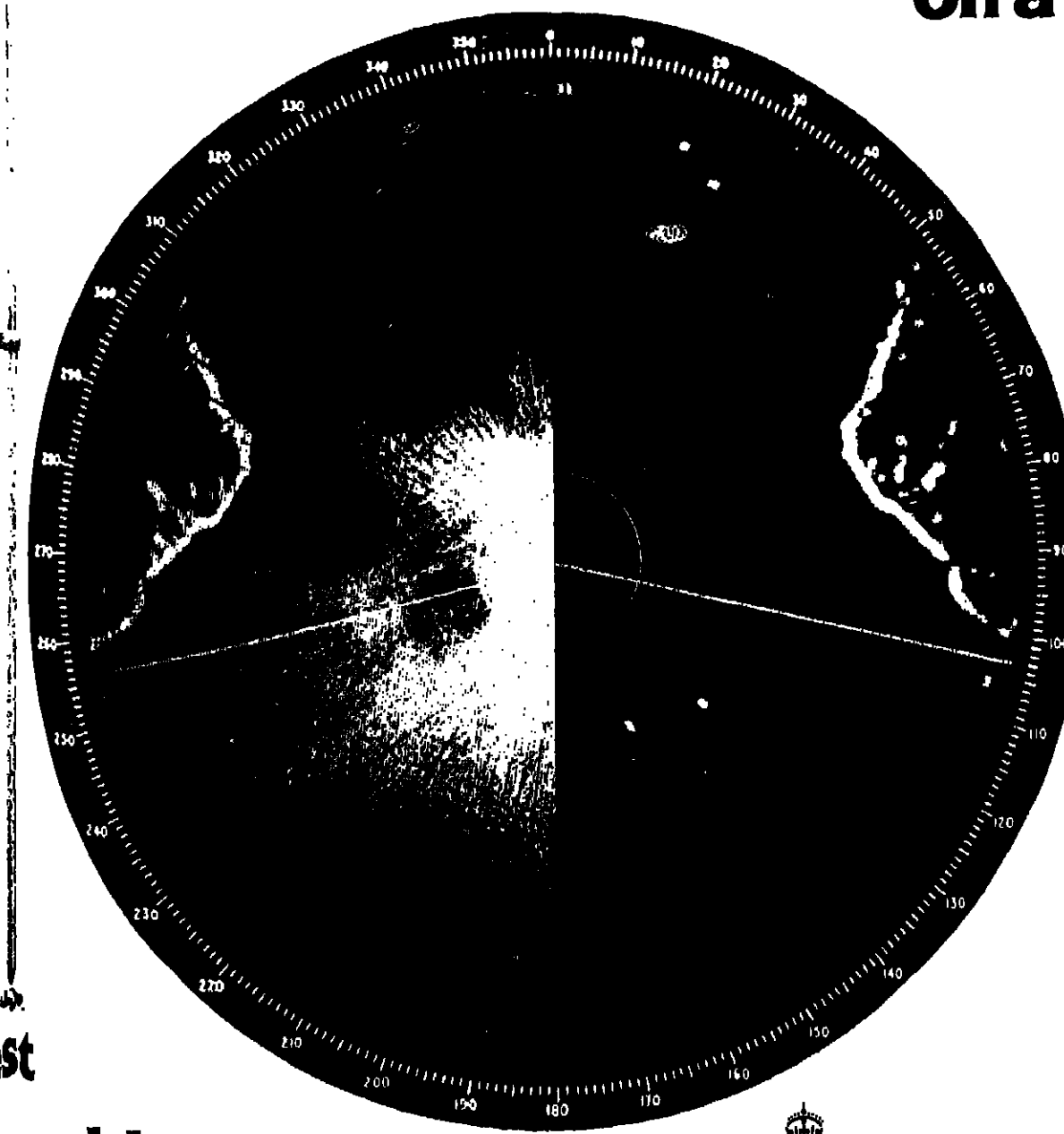
**Receiver noise** automatically removed.

**Weak echoes** automatically raised to full brilliance by digital video...

...and **echoes** 'stretched' automatically on longer ranges.

For the radar efficient ship.

**...improving the best marine radar in the world.**



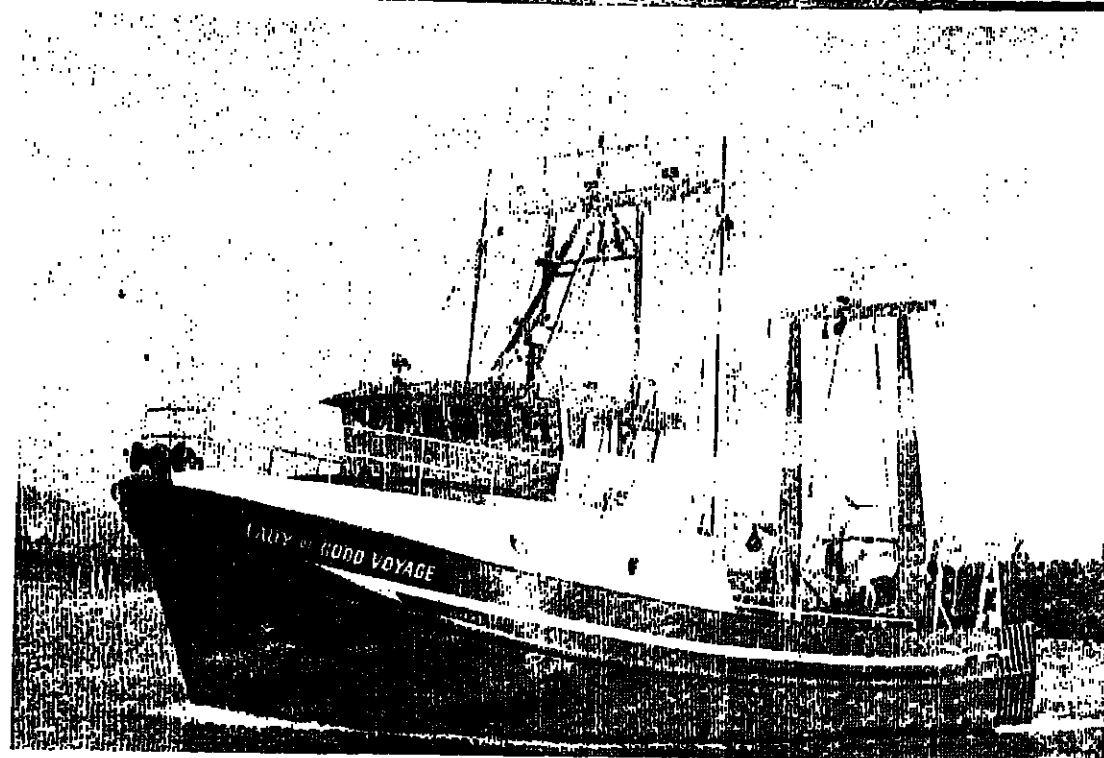
- Suppresses sea and rain clutter
- Suppresses noise and interference
- Makes echoes brighter - with more contrast
- Makes echoes longer

All these improvements can now be had with the unrivalled DECCA Solid State 9, 12 and 16 in relative and true motion displays and the famous AC display system, on both 3 and 10cm wavelengths.

**DECCA CLEARSCAN RADAR**



Decca Radar Limited, Decca House, Albert Embankment, London SE1 Tel: 01-735 8111



The 26-metre long "Lady of Good Voyage" for skipper Barry Fisher. She is the first of a series of vessels bringing some entirely new features to the US west coast fleet.

## American 'Lady' feeds hake to Soviet ship

AN INTERESTING new design of compact fishing vessel was introduced into the United States west coast fishing industry in September.

She is the 26 metre (86 ft) long "Lady of Good Voyage", a double gantry trawler designed by Jack Wilsky who heads Mid-Coast Marine Inc., the Coos Bay, Oregon, yard which built the boat.

As significant perhaps as her design is the fact that the new boat is skippered by Captain R. Barry Fisher, who is also a member and manager of the owning company, Seawest Fisheries Ltd.

Captain Fisher has been tireless in his attempts to find ways in which US fishermen on the west coast can make the best possible use of the opportunities opened up by the 200-mile limit.

One way of obtaining better prices for fish not in great demand in the United States will be to sell it direct to factory ships of countries where it is in demand.

The "Lady of Good Voyage" is catching hake and supplying it to a Russian factory vessel that is under contract to Marine Resources Company, a USSR/USA joint venture.

### Broad beam

Features include a broad 26 ft (7.92 metre) beam and a shallow hull.

Power is provided by K/T 1150 Cummins diesels through Twin Disc 514 gear.

Six-ft (1.8m) propeller shafts are all that are required due to the engine being placed far aft beneath the stern gantry.

To maintain a near level shaft alignment, the main power units are housed partly in pods that extend below the plate line where the bottom begins to sweep upward.

Auxiliary power for electricity and for pumps for the extensive hydraulic circuits is provided by two Cummins diesel-electric units, a model NT 335 and a V 504, each with pumps mounted on power take-offs.

The trawl is handled by Marco WT 202 trawl winches. The net is retrieved by the main forward drum or by the

auxiliary drum, located over the ramp, that acts as a back-up system as well as a place to carry a spare net.

These eight-ft wide (2.4 m) net winch reels have six-ft (1.8 m) diameter, reinforced flanges and an 11 in (28 cm) hub.

Winch controls for the fishing operations, including the two Gearmate split winches located on the uprights of the forward gantry, are all in the wheelhouse. The boat can be worked by the skipper and a crew of three.

### Optimum size

The fish hold spans the hull beneath the work deck area and has a capacity for 500,000 lb of fish.

Like most features of the vessel, the overall size was chosen as the optimum for capacity, crew size, seaworthiness and investment. The close proximity of US fish resources means that efficient harvesting can be done in compact vessels.

The trawlers are constructed using a modular technique that permits prefabrication about the yard.

Only the bow section is built in place directly to the primary lay of the keel.

The stern section — the portion aft of the fish hold — is built in an inverted position behind the keel.

This section is the main engine room. After fabrication, it is rolled forward into an upright position and attached to the bow section by two wing modules that are fuel tanks which form the outside of the vessel and the side wall of the fish hold.

### Instant hull

Once ready, these four basic units are assembled into what appears to be an instant hull, all in a single day.

The gentries and the engine units are the other main sub-assemblies.

Six vessels are already scheduled for the series of which the "Lady of Good Voyage" is the first.

The second is already well under construction, and the fifth and sixth are for the same Seawest Fisheries ownership.

## Fishery research Simrad has the "resources"



Simrad hydroacoustic equipment in the instrument room of a modern research vessel

Management of fisheries requires reliable knowledge of fish resources for effective control and regulation of their exploitation. Simrad hydroacoustic research instruments provide the most rapid and convenient way of collecting reliable data for estimating fish stocks. The search for new, unexploited fish stocks in deeper waters also calls for the best possible fish detection equipment.

Since 1959 Simrad has produced hydroacoustic instruments especially developed for fishery research and the company's long experience in this particular field has led to today's range of highly sophisticated equipment for the monitoring of fish stocks all over the world in all types of water from lakes to oceans:

### Towed Body

To make echo surveying possible in rough weather.

### Echo Sounder Monitor —

For through water measurements of echo sounder performance.

### Stabilized platform

Stabilizes hull-mounted transducers against ship's roll and pitch movements.

### EK-S Scientific Echo Sounder.

The basic unit in the hydroacoustic instrumentation system. Working frequencies: 12, 18, 38, 49 120 kHz

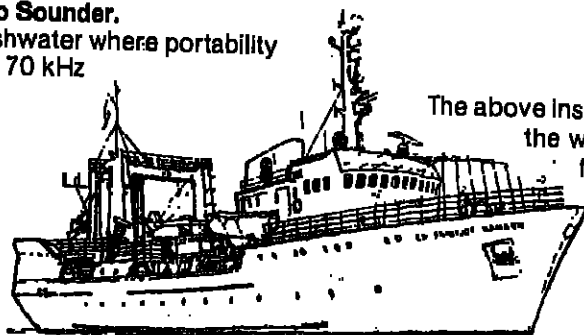
### EY-M Portable Scientific Echo Sounder.

Mainly intended for use in freshwater where portability is a must. Working frequency: 70 kHz

### QM Echo Integrator

For the quantitative measurement of echo signals.

### TE Additional High Power Transmitter



The above instruments, in combination with the wide range of Simrad standard fishfinding equipment, fill the need for hydroacoustic instruments on modern fishery research vessels.

For more information about the Simrad hydroacoustic instruments for fishery research, please write to:

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Telephone: (033) 44 021  
Telegram: Simrad Horten  
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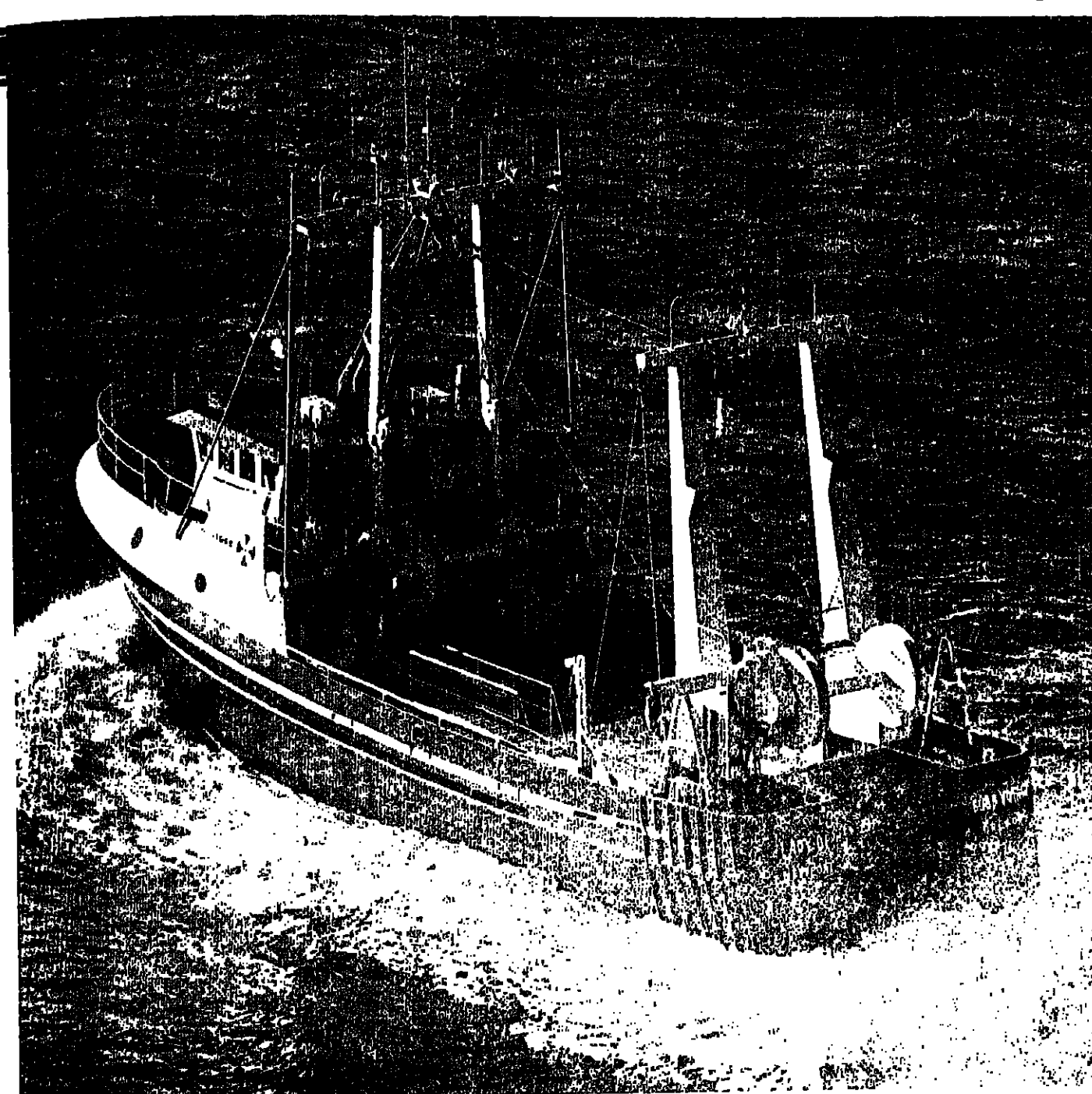
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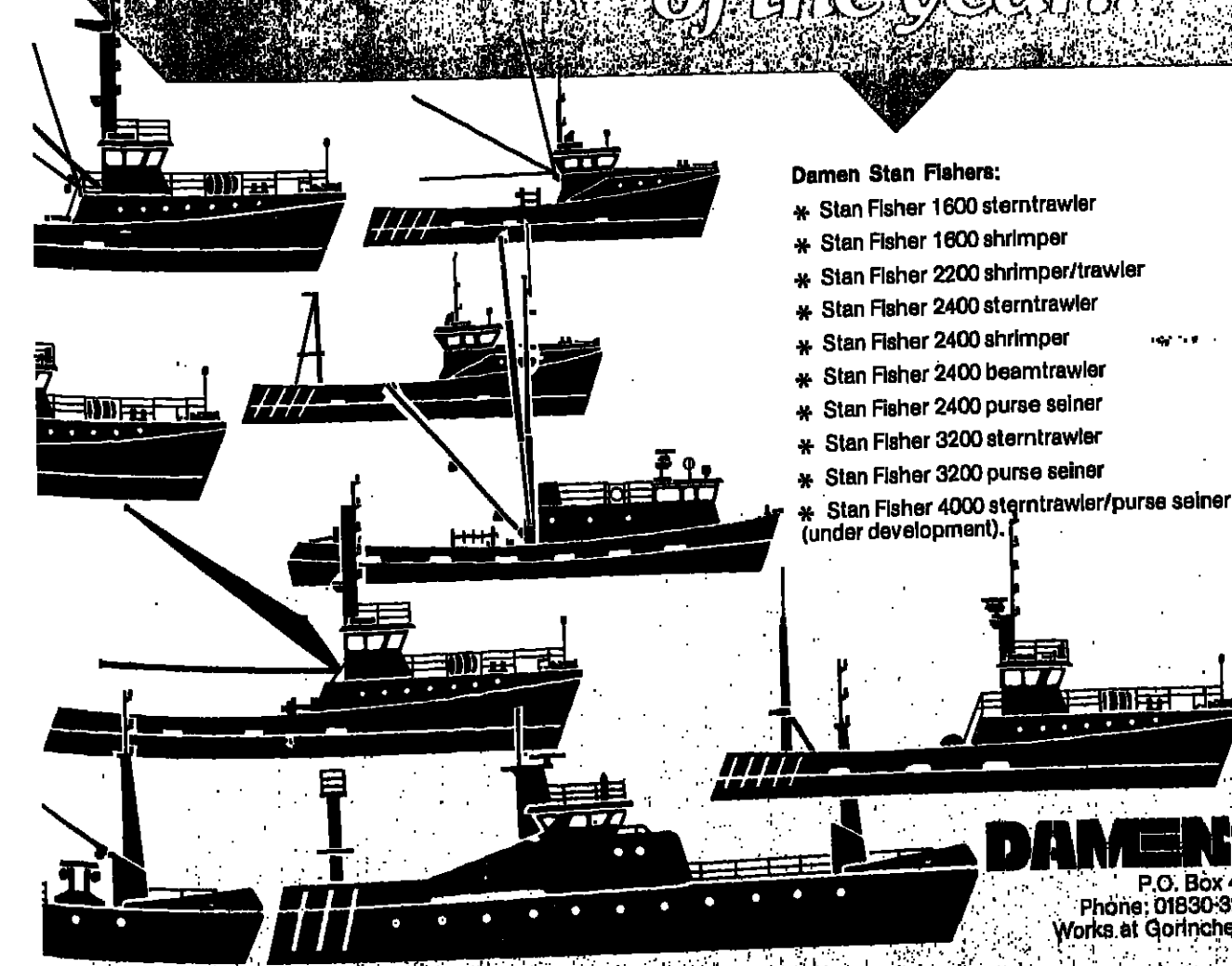


## The skipper —a leading light in US west coast fisheries...



Barry Fisher, skipper of the "Lady of Good Voyage," is as active ashore as he is at sea in promoting the interests of US west coast fishermen. He is seen here during a seminar at the 1977 US Fish Expo in Seattle.

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- \* Stan Fisher 1600 shrimp
- \* Stan Fisher 2200 shrimp/rawler
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- \* Stan Fisher 2400 purse seiner
- \* Stan Fisher 3200 sterntrawler
- \* Stan Fisher 3200 purse seiner
- \* Stan Fisher 4000 sterntrawler/purse seiner (under development).

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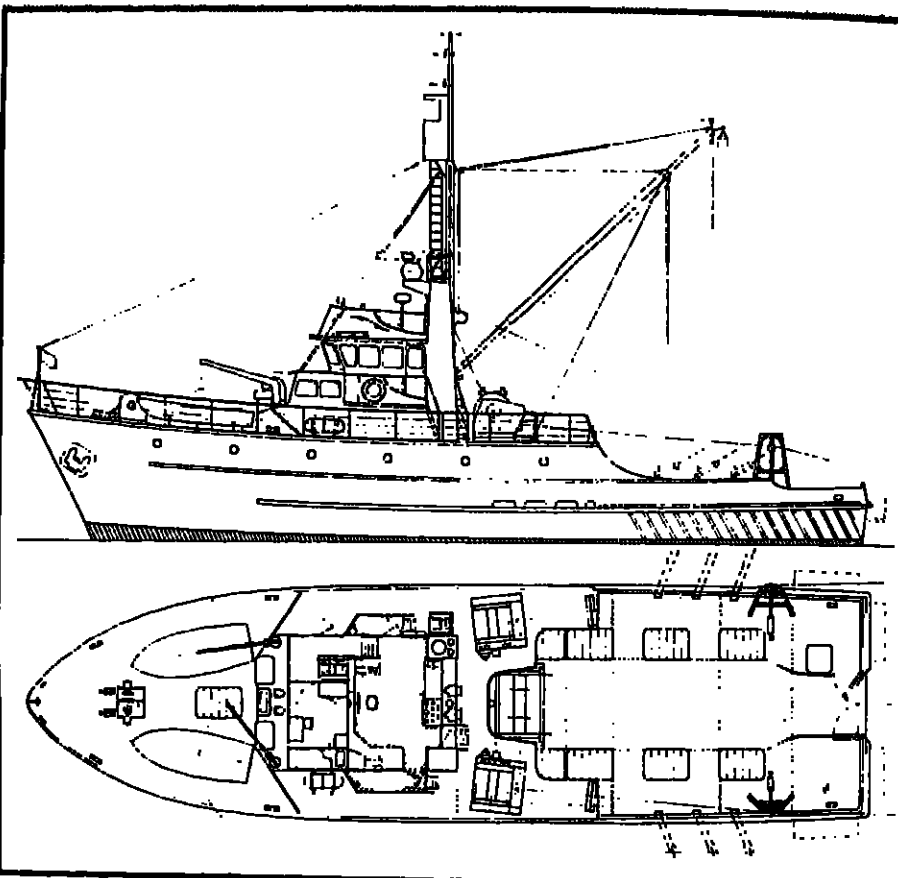
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## BOATS &amp; BUILDERS

# AUSTRALIA'S 'DUAL PURPOSE FISHING MACHINE'



Profile and plan of the new 28 metre vessel. She is designed by Boden & Associates in Sydney, Australia.

WITH THE extension of Australian fishing limits out to 200 miles, enterprising boatowners and fishermen may be looking to new designs of compact vessels. As in the United States over the past few years, the economic zone could be a boon to builders, to fishermen, and to designers who come up with the right type of vessel.

One promising steel boat is now being built by Fami Fabrications at Port Kembla. She is a combination stern trawler and tuna pole boat and is described as a vessel of advanced design "intended to provide her owners with a completely dual purpose fishing machine."

Tuna live bait poling in the season will be the prime function of the boat; her second function will be bottom and mid-water trawling. Both functions received the fullest consideration of the designers, Cecil E. Boden and Associates.

## Hull dimensions

The boat is 27.8 metres long overall and 23.9 metres b.p., with a breadth of 7.6 m and working draught at stern of 3.25 m.

The fish holds, aft of the engine room, consist of four pairs of insulated compartments port and starboard of a central tunnel. Total capacity of these spaces is 118 cubic metres with a total load of brine and fish of 120 tons.

All the compartments are fitted with

## Compact trawler-tuna pole fisher could cash-in on 200-mile boom

refrigerating coils operated by two Freon R.12 compressors of 15-ton refrigeration capacity, each driven by a 30hp, 415-volt motor. Tuna preservation will be by brine spray in all tanks to -10° C. Fish may be stored in tanks either dry or packed in ice.

When the boat is fishing for tuna, the compartments may be used initially for live bait. For tuna, six Autopole hydraulic poling machines will supplement the work of the crew. An overboard spray system is installed around the bulwarks aft to excite the tuna.

When trawling, a twin motor net drum at the forward end of the aft fishing deck will be worked in conjunction with the split warp winches mounted port and starboard on the superstructure deck.

Each variable speed warp winch will have a

pull of 3.35 tons full drum and 10.87 tons empty drum with a mean pull of 5.08 tons. The winches are of dual speed capacity. The net drum has a two metre flange diameter and a barrel length of two metres with a pull of three tons on the top layer and 11.5 tons on the bottom layer.

## Trawl galleys

A pair of hydraulically controlled galleys for the warp blocks are arranged port and starboard about 3.5 m from the stern. These can be removed if desired when the boat is tuna poling.

An important feature of the hull design is the extension of the sides of the superstructure to within a third of the boat's length from the stern. From this point, the bulwark extends at normal height to within about three metres from the

transom where the height is lowered to assist poling.

Comfortable accommodation is provided, with skipper's cabin and four 2-berth cabins for the crew.

In the wheelhouse navigation instruments and fish finders are arranged in a compact console. For fish finding, the boat will carry Koden SRM 673 sonar, Simrad EQ echo sounder with MC scale expander, and Skipper 603. Navigation equipment will include Decca radar, Magnavox 1112 Satellite Navigator, and Simrad NI doppler speed log.

The main engine will be a Mirreless Blackstone F51.8M turbocharged diesel rated at 1220 hp at 1000 rpm and turning a controllable pitch propeller (in steering nozzle) through a Reintjes reduction gearbox.

## What about a GRP propeller nozzle?

A SMALL BOAT builder in New England, USA, has developed a propeller nozzle made of GRP laminate. It is claimed to be half the price of a similar steel nozzle and is expected to open up a wide market among small fishing boat owners.

The prototype was made up of GRP with a foam sandwich core.

The nozzle is attached with wooden blocks top and bottom and by GRP rods to the hull from its forward edge.

The prototype has been installed on a 45 foot wooden trawler. If it proves successful, production will begin.

## New idea claimed to cut costs by half

Future models will be injection moulded to give a better surface finish inside and out.

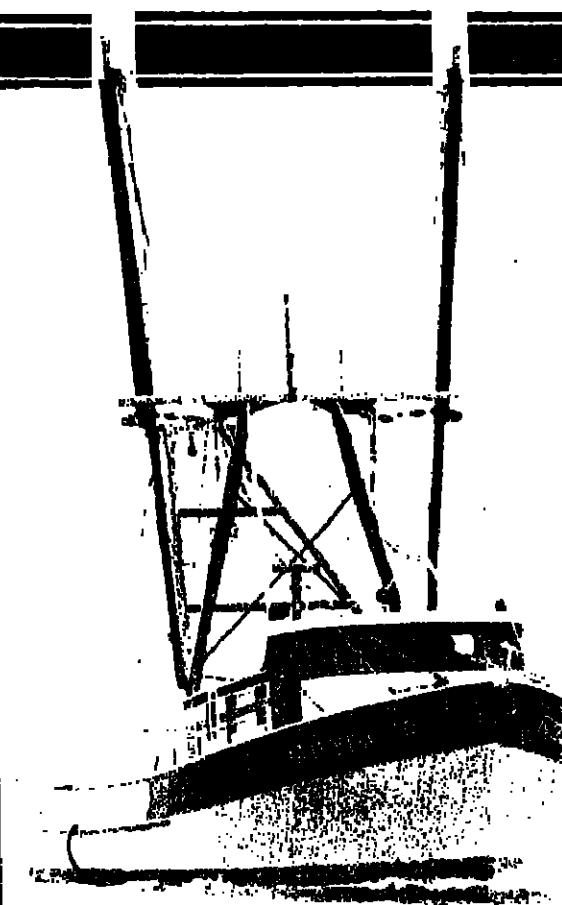
Kevlar fabric will be incorporated in the layup to give higher strength with less weight and better abrasion resistance, particularly on the

internal surface. A stainless steel ring will be inserted in the mould to reduce damage from ropes or debris entering the nozzle aperture. This ring will also provide the main base for the mounting points.

Propeller nozzles of this type can provide an increase in the thrust available for a given horsepower. This is valuable for towing operations such as trawling.

There is little or no reduction in free running speed and there is the prospect of better fuel economy.

Further information from: Les Makinen, Boatbuilder, Tenants Harbour, Maine, USA.



## Latest from Diesel Marine

LATEST US Gulf shrimp trawler from the Diesel Shipbuilding Company of Jacksonville, Florida, is the 72 ft (21.95 metre) steel hull Gulf King 55.

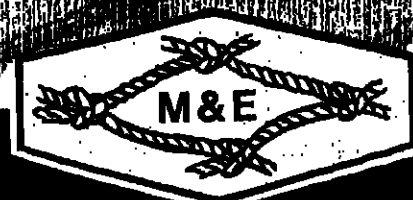
She is equipped with A-frame rigging and a Rice winch. Propulsion is by a Cummins KT 1150-M engine.



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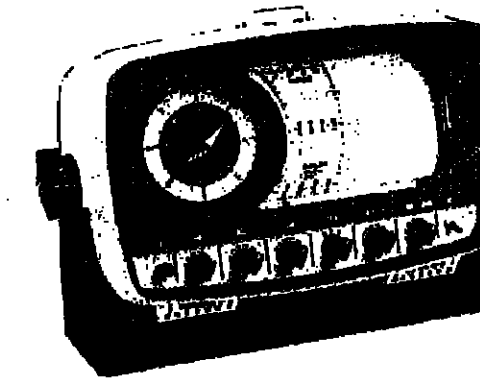
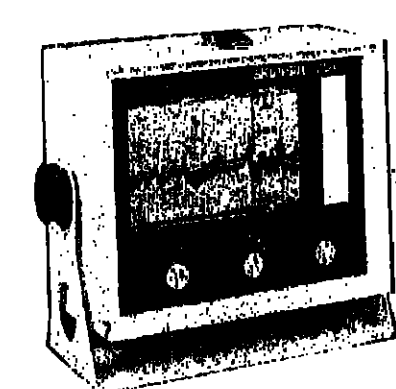
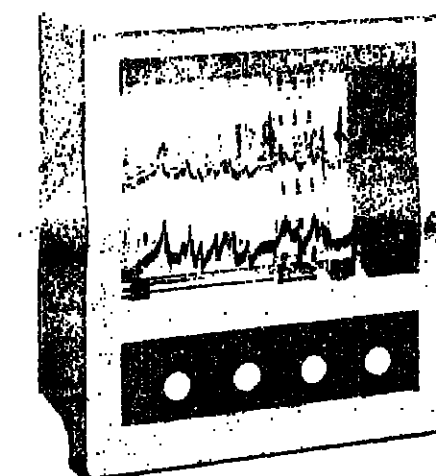
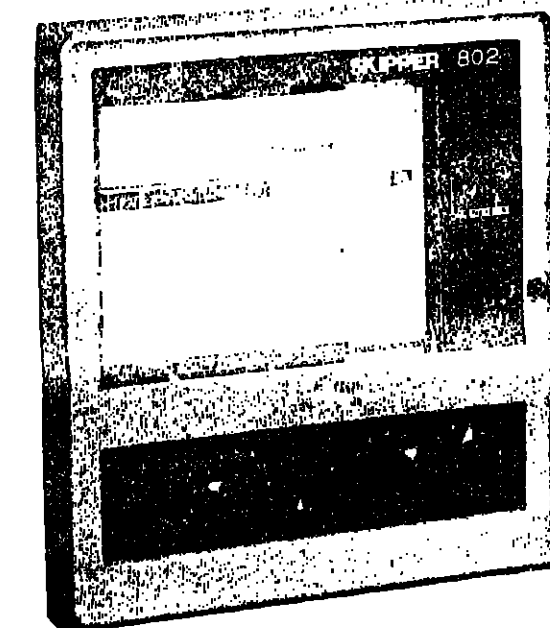
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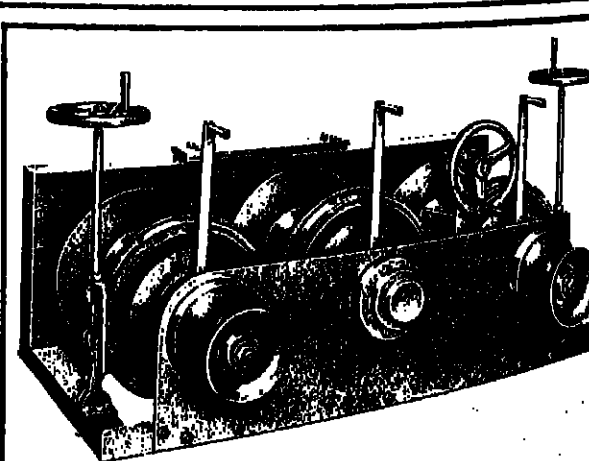
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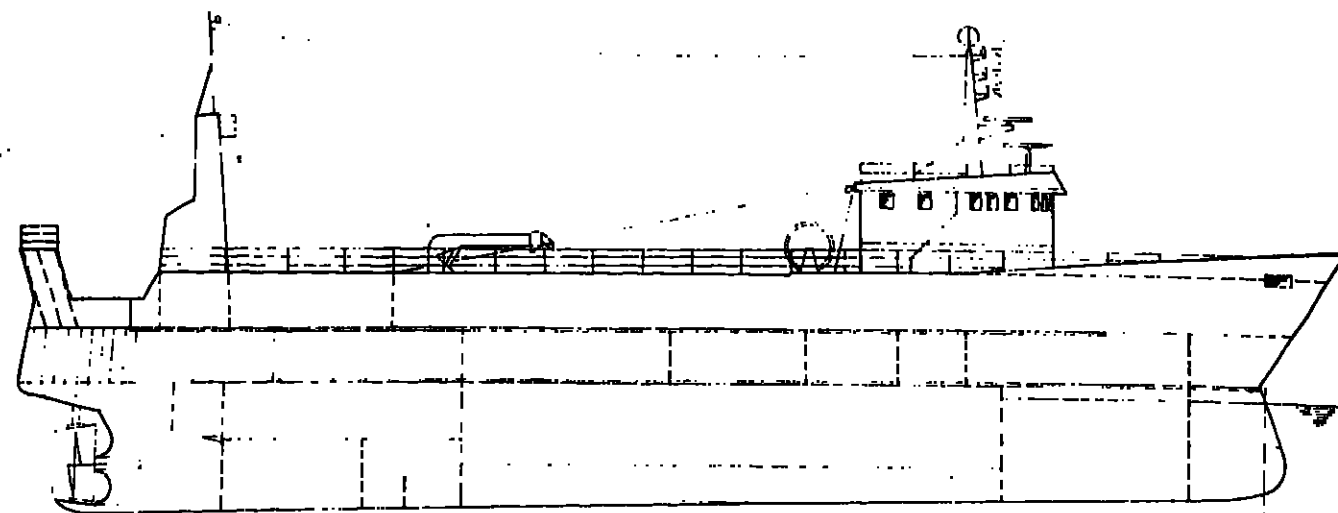
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## BOATS &amp; BUILDERS

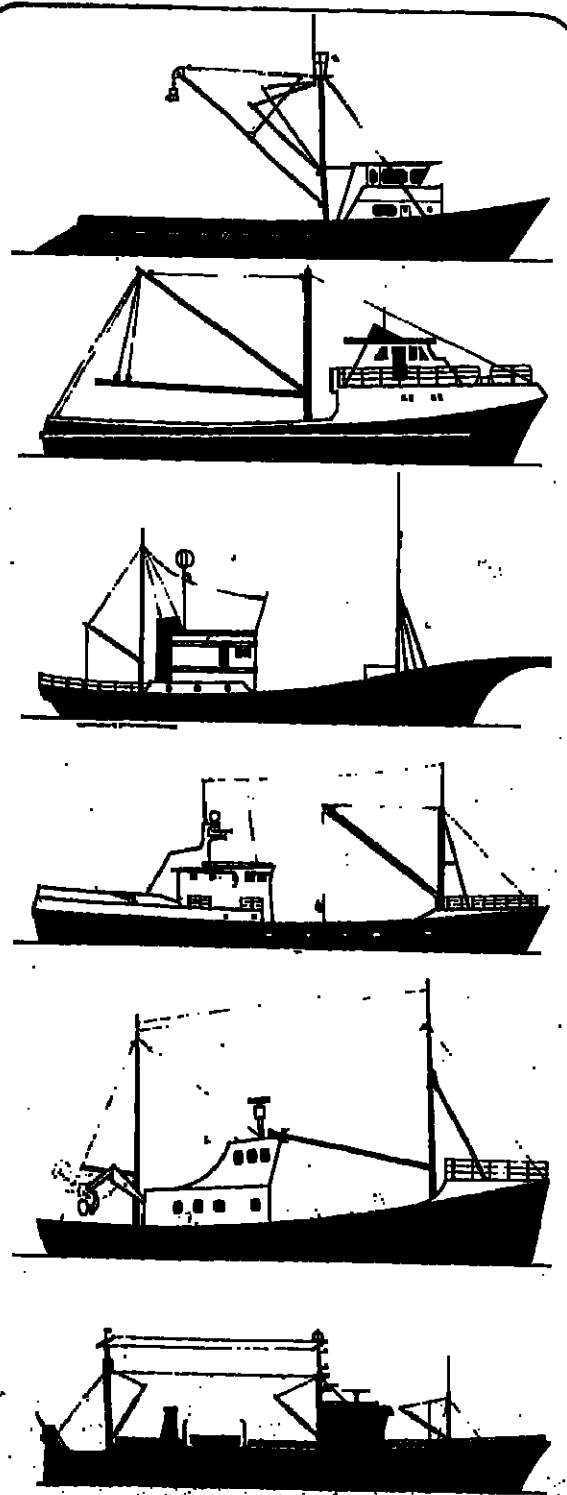
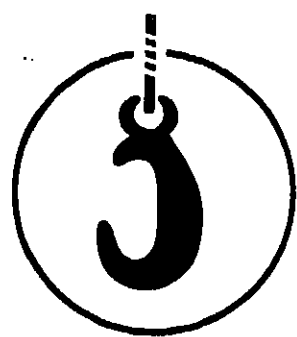
## MAIN DIMENSIONS

length oa 57.0m  
length bp 50.15m  
breadth 10.30m  
depth to  
upper deck 7.30m  
depth to  
main deck 5.00m



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## But Icelandic builder may need a buyer for largest trawler yet

THE Icelandic shipyard, Stalvik HF, has laid the keel of a 57 metre (187 ft) stern trawler for the home fleet. This is a major step for the yard, which in the past seventeen years has built 25 inshore vessels up to 25 metres long all for Icelandic owners.

The latest trawler has a beam of 10.3 metres (34 ft) and loaded draught of 7.3 metres (24 ft).

Design features include a full-length shelter deck, and insulated fishroom capacity of 660 cu m.

A Plassam ice plant will provide up to ten tons a day. Propulsion will be by a 2,200 hp West German MAK engine

with J1elix propeller and sterngear. The 2.9 metre propeller, larger than normal for a vessel of this size, is being fitted with a steerable nozzle from the Danish company Poul Ree. Brussels winches and steering gear have been specified, and it is expected that Simrad fishfinders will be fitted.

## Confident

Stalvik engineer Steinar Vingsson told *Fishing News International* that the sale of the trawler has yet to be confirmed. But, if the present deal falls through, the yard is confident that it will find a buyer and that the vessel will be in the water within eight months of signing.

## SHRIMPER ORDER



THE 12 shrimp trawlers to be built in Spain for the Soviet Union (See *FNI*, September 1978) will be slightly different from the prototype vessel shown at the Inrybrom exhibition in Leningrad in 1975.

Each vessel will be 28 metres long and will have two decks. It is not known where the Soviet fishing industry will use them. The trawlers are to be built by Construcciones Navales del Sureste SA in Alicante. The contract will require some reorganisation and expansion of the yard, which presently employs about 120 people.

The picture shows a tug under construction at the Alicante yard.

## BALSA CORE SPACE SAVER

### Modified 35-footer—45-footer to follow

VERSATILITY WORKBOATS, of Rye in England, have brought out an improved version of their 35 foot (10.7 metre) hull which incorporates a balsa core construction.

The first boat to be completed to this specification was exhibited at the Southampton Boat Show in September. The 35-footer has a heavy displacement hull with beam of 13 ft 6 in and a draft of 5 ft. This gives a normal displacement of 17 tons.

The hull is laid up in a mould in the normal way, but instead of the internal framing, a layer of resin impregnated end-grain balsa is applied down to the turn of the bilge.

Further laminate is laid up over this core and the result is a very rigid structure.

Absence of internal framing gives more useable space inside the hull and makes for much easier cleaning of spaces such as the engine-room and the fish hold.

The bulkheads in the new hull are constructed from GRP foam sandwich.

The prototype boat is fitted with a Ford Sabre 120 hp diesel mated to a P.R.M. gearbox of 3:1 reduction.

There is a small cabin forward with two berths and cooking facilities are provided in the large wheelhouse.

Alternative sizes of wheelhouse are available to meet different requirements.

## Larger boat

Following the development of the 35 ft balsa cored hull, Versatility Workboats are now developing a 43 ft (13.1 metre) boat using the same type of construction.

The new design is for a heavy displacement vessel with an overall length of 43 ft 4 in and beam of 18 ft 6 in.

While it has been developed as an aft wheelhouse vessel, forward wheelhouse versions will be available.

### 'Provider' steel hulls go fishing

BRITISH builder Colonial Craft Cumbria has developed a commercial fishing version of its Provider Trawl-steel hull.

With a length overall of 7.45 metres (24.5 ft), the boat has a breadth of 2.84 m (9.3 ft) and a maximum draft aft of 0.8 m (3 ft).

The hull is of all-welded double chine construction.

## Girders

It is supplied ready for fitting out and the engine girders may be tailored to suit the owner's choice of engine.

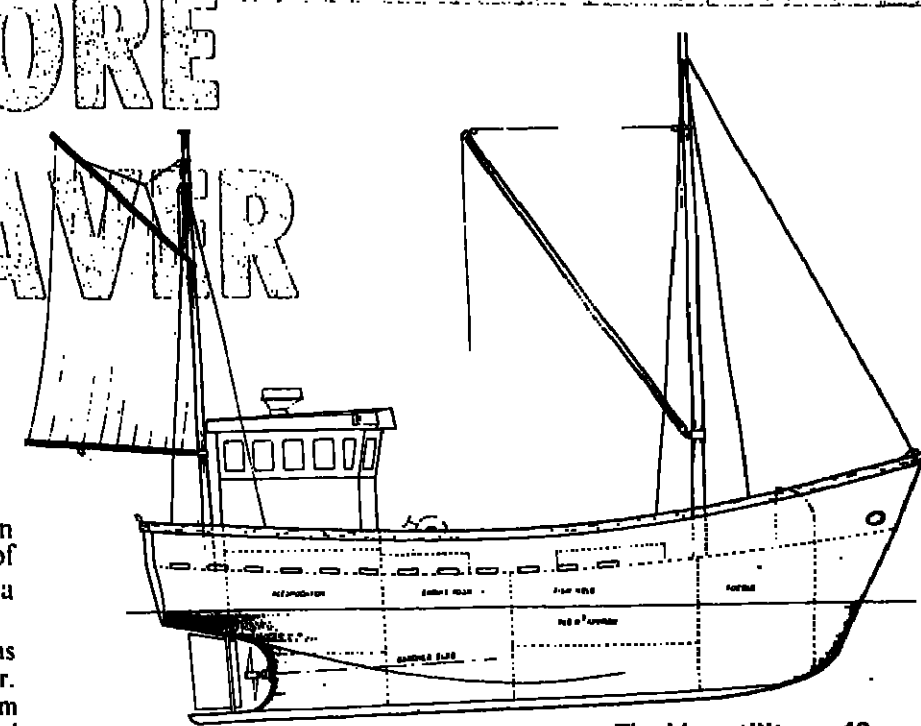
A speed of six to seven knots can be achieved, depending on the installed horsepower and propeller.

Space is provided forward for two bunks, w.c., wash-basin and cooker.

According to Colonial Craft the design was prepared "after considerable research into the inshore fishing market."

The company says that the size range will soon be increased by a nine metre (29.5 ft) and an eleven metre (36 ft) hull.

First deliveries of the Provider 7 took place in October. Construction time is about five weeks.



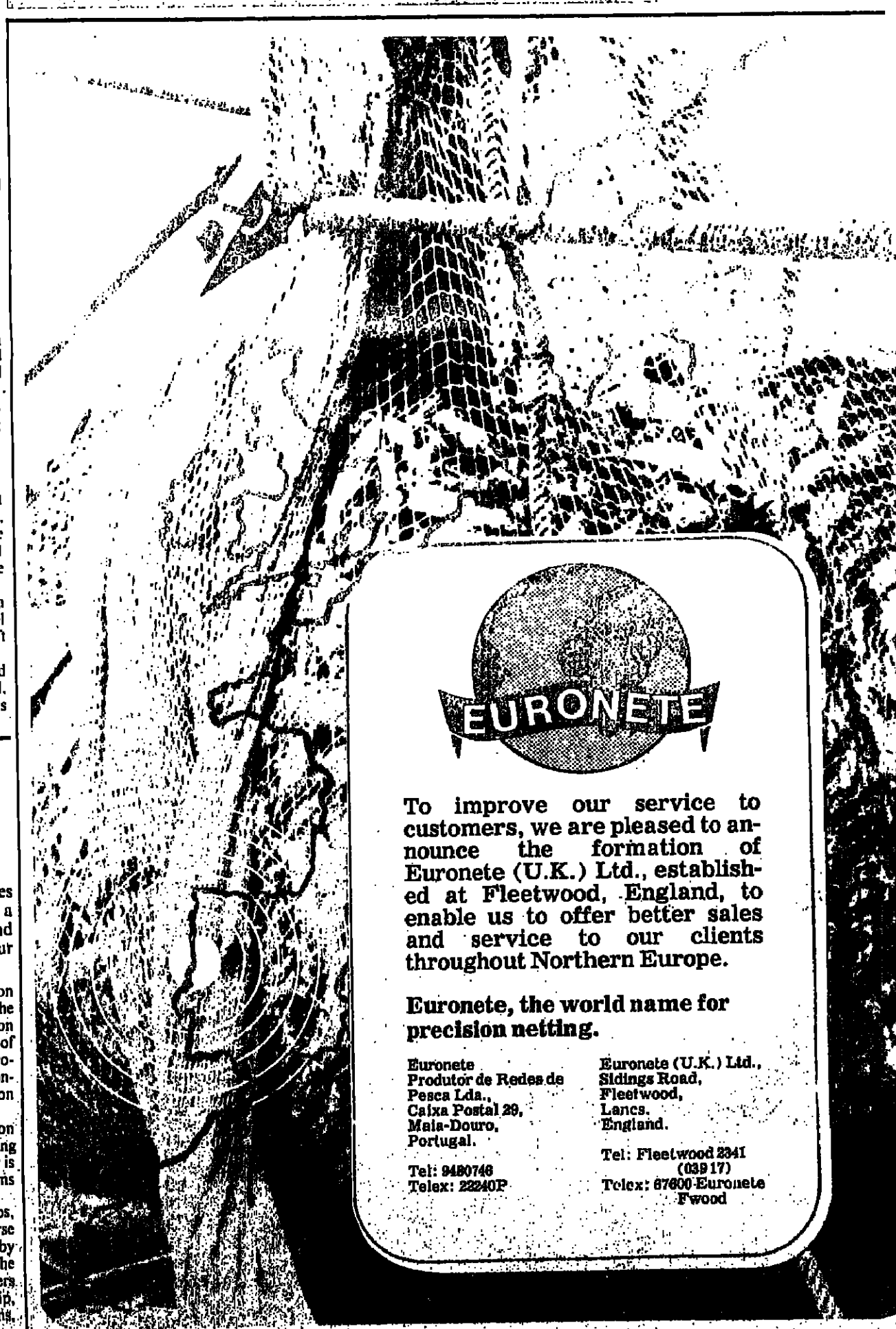
The Versatility — 43.

## SURVEY LAUNCH DUE SOON

THE Chantiers de la Perriere yard is building a fishing site surveillance launch for the Fishery Department of the French Maritime Administration.

Due to be delivered by the end of 1978, the launch is 49 metres long overall, has a moulded breadth of 7.5 m, and depth amidships of 4.7 m.

She will be propelled by two SACM diesel engines, each developing 2,100 hp at 1,560 rpm. Estimated speed at 270 tons displacement will be 19 knots.



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## GHANA PURSER CONTRACT

MANKOAZZE Fisheries Ltd., Ghana, has signed a contract with Haugesund Slip A/S, Norway, for four purse seiner/trawlers.

Worth about 54 million kroner (£5 million), the contract follows the decision in June by the board of NORAD to support proposals by its fishery consultants for combination vessels.

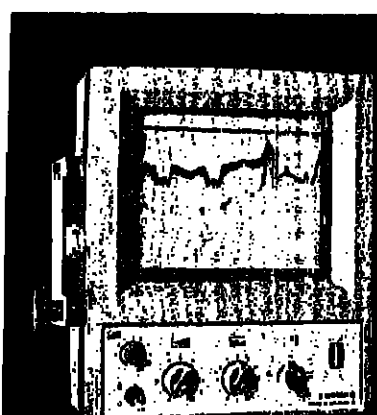
Work is also to proceed on a project to build fishing ships for Nigeria. The order is for six ships on credit terms over seven years.

It is for two factory ships, two trawlers and two purse seiners which will be built by yards associated in the Western Norway Shipbuilders Association — Langsten Slip, Karmund M.V. Elde & Son, and Soviknes.



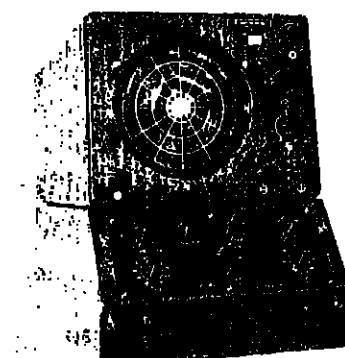
Countries world-wide are taking part in joint

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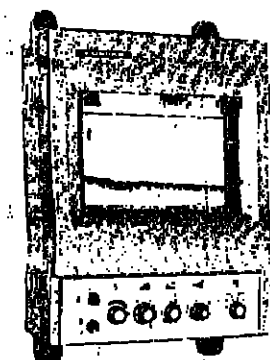


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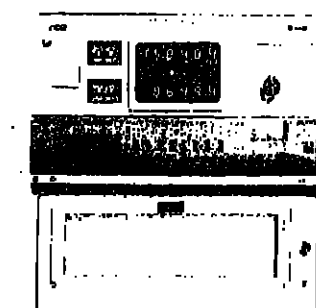
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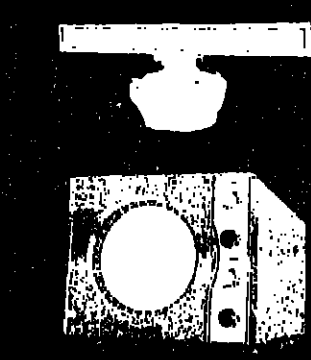
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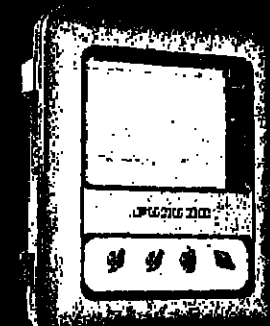
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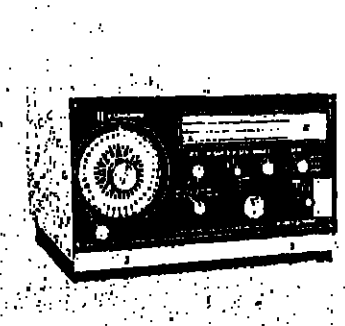
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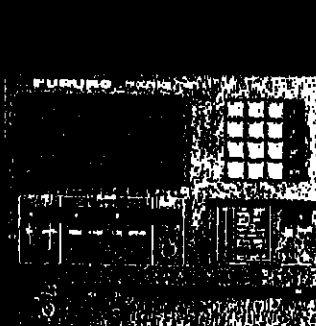
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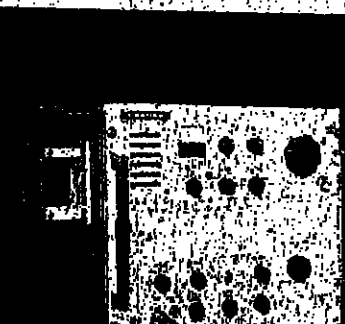
MARINE RADAR FRS-48

High sensitivity, solid-state, IC amplifier. 7" CRT, 10KW output. 1/2 to 48 miles.



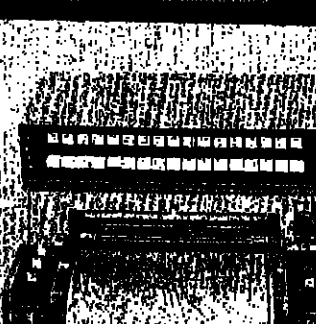
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## NZ and America in link to catch skipjack

OPTIONS for the development of New Zealand's fish resources within her 200-mile economic zone should start from the premise that the local industry should harvest, process and export as great a proportion of the total resource in as short a time as economically possible.

But co-operation with foreign fishing interests was accepted by New Zealand's Fishing Industry Board, in discussion with government departments, as one way of developing resources "which would be difficult, risky or impossible for the NZ industry to develop on its own."

### Committee

In its report for the year ended March 31, 1978, the Board notes that the government set up a committee to consider all joint venture proposals where foreign participation exceeded 24.9 per cent. The Board argues that, as a statutory body, it should be represented on this committee.

One joint venture company already operating is the New Zealand Pelagic Co. (1976) Ltd. This involves NZ and United States interests.

It had a successful season catching 7,000 tons of skipjack with its charter vessels. New Zealand vessels, including the *Finisterre*, caught 3,136 tons.

While it supports the venture in principle, the Board is concerned that charter vessels have been allowed some rights to fish inside 12 miles in the Bay of Plenty area.

"The practical feasibility has been established," says the Board in its report, "but there remains matters such as high freight costs, and imports duties and quotas on squid in the Japanese market, which will need to be resolved before the full economic feasibility of such an exercise is clearly established."

Also noted by the Board is the British fishing mission which visited New Zealand briefly in February, 1977.

But the Board adds that "it was generally accepted that this group was neither well enough briefed nor did it spend sufficient time in New Zealand to enable its report to be particularly meaningful."

ventures...but there are problems

# NOT Canadian report on Japanese 'takeover'

CANADIAN government concern that its west coast fishing industry is drifting into Japanese control has been confirmed by a special fisheries department report. This says that increasing Japanese investment could seriously impede Canadian control over the \$360 million a year British Columbia fishing industry.

The report's author, Trevor Proverbs, says the Japanese are known to have invested almost \$20 million in B.C. processing firms during the last five years and an untraceable amount could possibly double this.

Already 12 of 60 west coast processing

companies are partly or wholly owned by Japanese interests.

The report says Marubeni Corporation has bought up \$12 million of debentures put out by B.C. companies.

For more than a year, the Pacific division of the fisheries department has been warning of increasing Japanese control but Ottawa has not taken any action despite Fisheries Minister Romeo LeBlanc's vow that foreigners should not be allowed to take over.

Mr. LeBlanc likes to say that the 200-mile limit was implemented to get the foreigners out of the Canadian fishery and it doesn't make sense to turn around and let them in the back

door by buying into Canadian companies.

This policy guided his opposition to a proposal by Nordsee of West Germany to buy a controlling interest in a Newfoundland fish plant.

### No panic

However, Jerry Spitz, president of the Fisheries Association of B.C., said the increasing Japanese investments shouldn't be viewed as "a panic situation."

The investments are attempts to insure adequate fish supplies for Japan which has lost many of her traditional overseas fishing

grounds through 200-mile limits.

But Trevor Proverbs says the Japanese are offering various incentives to the Canadians, such as equity investments and debentures to guarantee fish supplies.

Exports of fish and seafood from B.C. to Japan have climbed from \$25 million in 1974 to \$109 million in 1977.

The processing sector is over expanded in B.C. and further expansion could squeeze established businesses. The Japanese could capture a guaranteed supply of fish for their domestic market using their vast financial reservoir meaning Canada would have lost control over the resource.

## Germans nearer to Australia

THE POSSIBILITY of a joint Australian-West German fishing industry project has moved a step nearer, following the visit of a nine-man economic delegation from Schleswig-Holstein to Australia in September. The delegation spent most of its time in Victoria and visited the fishing port of Portland.

It will recommend sending to Australian waters, for up to a year, a large research vessel to gain information on which future decisions can be made.

The West Germans' representative in Melbourne, Lt. Col. John McLean Bennett, announced: "The delegation feels very confident about the possibility of finding fish and, if satisfactory data are available, would make a recommendation for a complete fisheries project. This is likely to include onshore processing facilities, marketing arrangements and the building of trawlers to German design, together with financing to support the project."

"During research fishing, catches would be initially processed on board and transferred to an Australian plant for packaging and test marketing."

"During the collection of data, assessment will be made of the commercial viability of the project. If suitable fish are found in acceptable quantity, the project would be developed progressively as the ship continued its research."

The research vessel is likely to be a stern-trawler factory-ship of about 2,500 tons, with a crew of 56 and two West German scientists. Two Australian scientists would be invited to join the study.

With John McLean Bennett and Co. Pty. Ltd., the West Germans have set up a new company, Austrakiel Pty. Ltd.

## POLES TAKE HAKE

POLAND and Canada have used an experimental joint venture off British Columbia to help increase Polish fish supplies and ease the pressure on traditional stocks off the west coast.

The Poles were allowed to take 11,500 metric tons of hake (a species with little popularity in Canada) as long as they bought 5,000 tons directly from two Canadian catcher vessels.

A 3,000-ton Polish processing ship, the *Crater*, anchored off the British Columbia coast and paid the Canadians \$132 a ton for the catches they delivered.

Aboard the *Crater*, the hake was immediately processed into fillets and then frozen.

The two Canadian supply vessels are among the largest of their type in British Columbia. Their diversion to the hake fishery provided some badly-needed respite for the traditional bottom fishery, said officials.

## And in Argentina...

JAPAN is interested in expanding her collaboration with Argentina in exploiting fishing and marine resources south of the 40th parallel in Argentine waters, according to Senko Suzuki, a member of the Japanese Chamber of Deputies and ex-Minister of Agriculture in Japan.

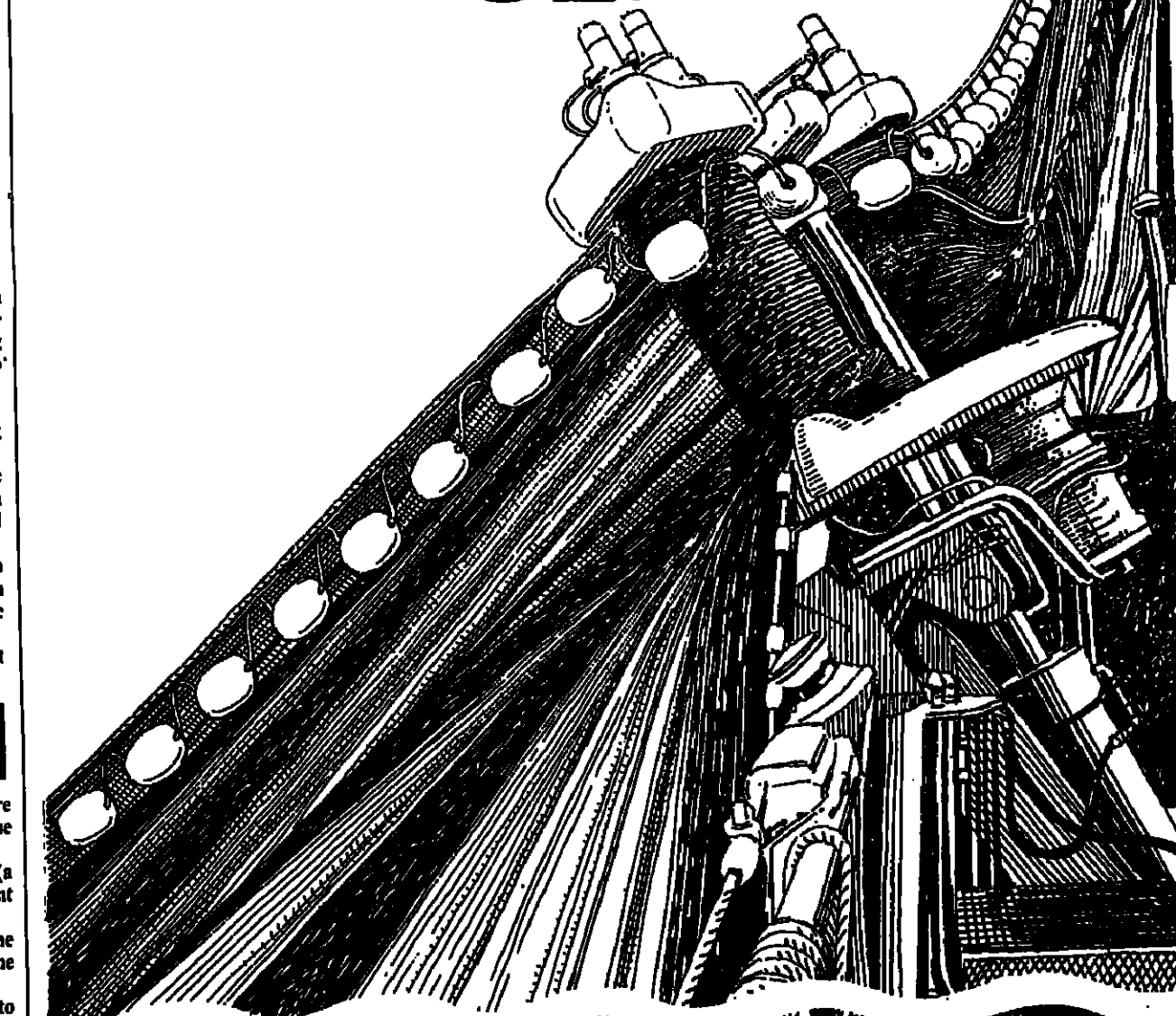
He headed a fishing mission composed of private Japanese businessmen who visited Argentina recently.

The mission participants explored possibilities to increase co-operation in the fishing industry.

Earlier this year, Japan and West Germany were awarded one-year contracts for experimental fishing research and exploitation in Southern Argentine waters.

A Japanese research ship, the *Shinkai Maru*, has been conducting feasibility studies in the area since April 10 and, according to Suzuki, has produced "promising results."

## PURSE SEINING



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## PORTS &amp; MARKETS

## Fishermen find direct buyers

BULGARIAN and Swedish buyers are to take more than 30,000 tons of squid and mackerel directly from Newfoundland fishermen.

Bulgaria has contracted to buy 1,500 tons of squid and 10,000 tons of mackerel. The Swedish fish trading concern is reported to be buying 10,000 tons each.

These deals have annoyed Canadian processors; but they have delighted Newfoundland's inshore fishermen.

Richard Cashin, president of the Newfoundland Fishermen, Food and Allied Workers Union, one of the driving forces behind the sale, said the squid and the mackerel are surplus to plant capacity in the province.

The Union has also attempted to work with the local companies in setting up another sales deal with Poland. Vessels from Poland already buy herrings direct from Bay of Fundy fishermen, and hake from British Columbia trawlers.

Plant operators fear that such arrangements may harm traditional markets for squid and mackerel. They allege that there has already been a fall-off in demand for squid from Japanese interests who may be buying from Bulgaria.

But the Bulgarian and Swedish deal has the blessing of Fisheries Minister Romeo Le Blanc who is pushing the industry to develop new markets for Canadian fish.

## British farmed silver eels are flown to Europe

FISH FARMER Maurice Ingram on the north Somerset coast of England in October made his first break into the European Common Market when he had 300 kilos of live silver eels flown to Holland.

Eels were airfreighted from Bristol's Lulsgate Airport to Amsterdam. Twelve hours later, gutted and smoked, the eels were on sale in the city's restaurants. Maurice is one of the pioneers of modern sea fish farming in England. Nine years ago, he began growing (he prefers the term growing to breeding) fish on a small site near Hinkley Point A nuclear power station using the station's warm outfall water.

He has since formed the company Marine Farms Ltd, with local Somerset businessmen and farms on a 1½ acre site leased from the Central Electricity Generating Board.

Equipped with eleven 22,000 gallon circular tanks, packing, storage and office facilities, the warm water connection to the power station is beginning to pay off. There is even the possibility of expansion. The company is presently negotiating with the CEBG for additional land.

The firm also rears young oysters for on-growing, but eels appear to offer the best prospects. Eelers are readily available from local eel stations.

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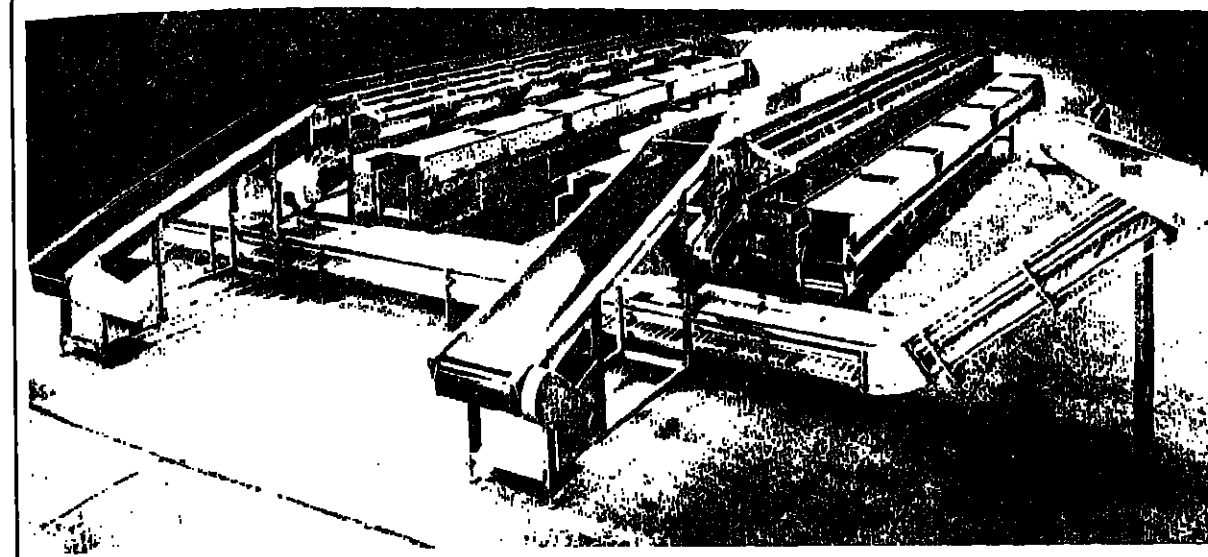
## Tuna trends

MORTON Research Corporation has prepared a comprehensive business information report on the market for tuna in the United States.

Its contents include a "profile" of the tuna fish consumer, examinations of supermarket sales, brand preferences in four major US cities, world output trends for canned tuna, details of US imports, price and advertising trends.

The 66-page report finds that Americans are eating one-third more tuna than they did in the early 1960s but that the competitive position of the fish within the overall seafood economy has declined.

Morton has also published a 1978 Seafood Study (priced at \$335 a copy). Details of this and the Tuna Fish Market report (priced at \$95) can be obtained from Morton Research Corporation, 1745 Merrick Avenue, Merrick, New York 11566, USA.



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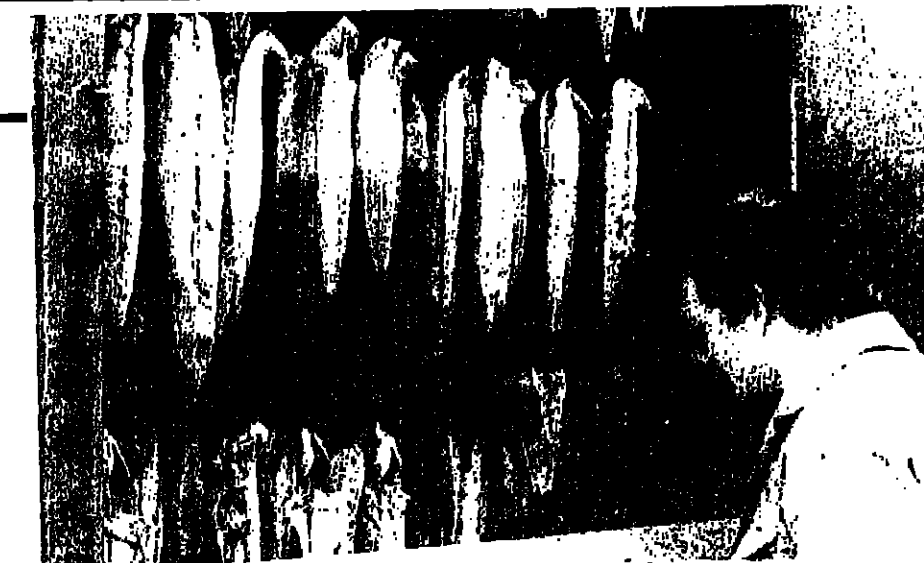
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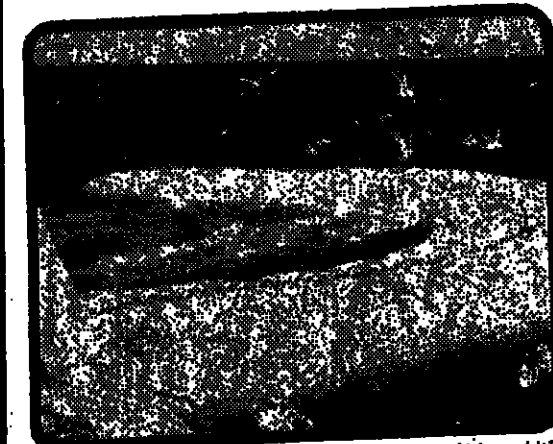
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We have supplied blue whiting equipment to:

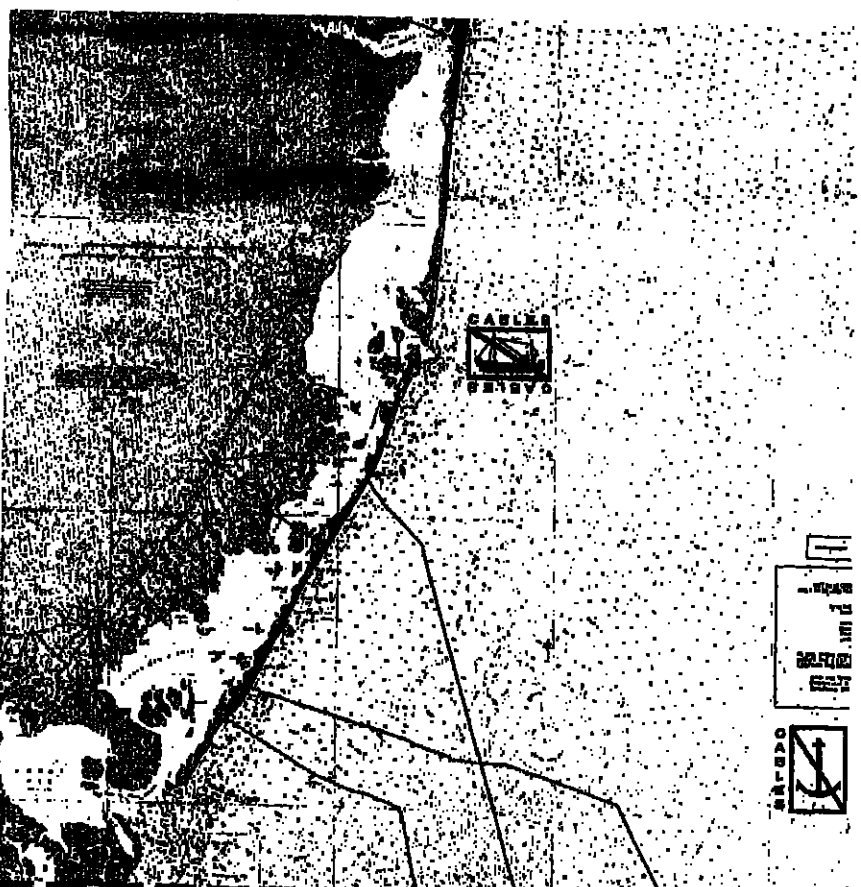
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We have already taken many orders for 1979 — when may we take yours? Naturally, we also make trawl equipment for all other fisheries. Please ask for quotations.



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Bel System



## PORTS &amp; MARKETS

## Fishermen find direct buyers

BULGARIAN and Swedish buyers are to take more than 30,000 tons of squid and mackerel directly from Newfoundland fishermen.

Bulgaria has contracted to buy 1,500 tons of squid and 10,000 tons of mackerel. The Swedish fish trading concern is reported to be buying 10,000 tons each.

These deals have annoyed Canadian processors; but they have delighted Newfoundland's inshore fishermen.

Richard Cashin, president of the Newfoundland Fishermen, Food and Allied Workers Union, one of the driving forces behind the sale, said the squid and the mackerel are surplus to plant capacity in the province.

The Union has also attempted to work with the local companies in setting up another sales deal with Poland. Vessels from Poland already buy herrings direct from Bay of Fundy fishermen, and hake from British Columbia trawlers.

Plant operators fear that such arrangements may harm traditional markets for squid and mackerel. They allege that there has already been a fall-off in demand for squid from Japanese interests who may be buying from Bulgaria.

But the Bulgarian and Swedish deal has the blessing of Fisheries Minister Romeo Le Blanc who is pushing the industry to develop new markets for Canadian fish.

## British farmed silver eels are flown to Europe

FISH FARMER Maurice Ingram on the north Somerset coast of England in October made his first break into the European Common Market when he had 300 kilos of live silver eels flown to Holland.

Eels were airfreighted from Bristol's Lulsgate Airport to Amsterdam. Twelve hours later, gutted and smoked, the eels were on sale in the city's restaurants. Maurice is one of the pioneers of modern sea fish farming in England. Nine years ago, he began growing (he prefers the term growing to breeding) fish on a small site near Hinkley Point A nuclear power station using the station's warm outfall water.

He has since formed the company Marine Farms Ltd. with local Somerset businessmen and farms on a 1½ acre site leased from the Central Electricity Generating Board.

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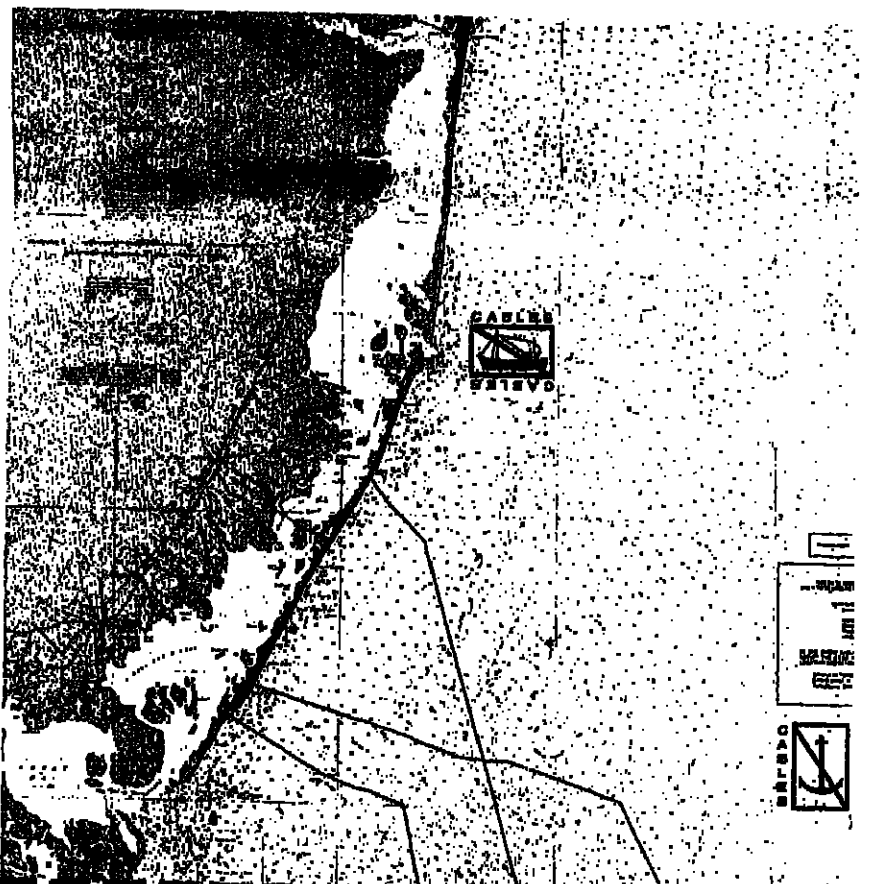
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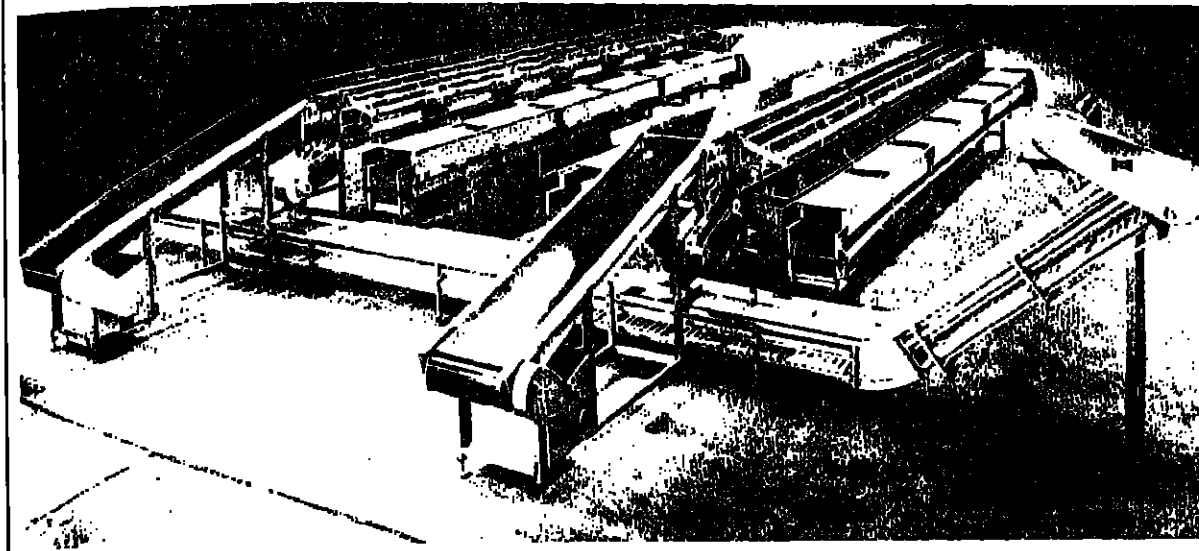


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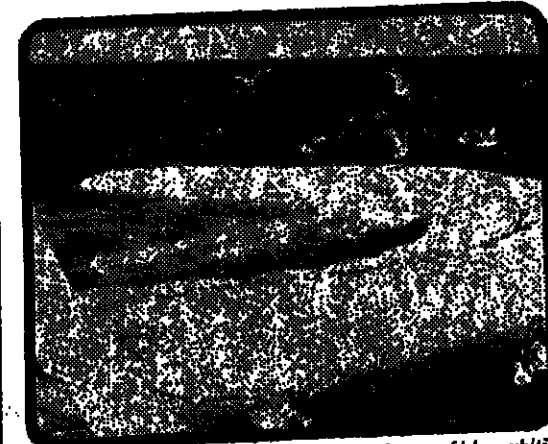
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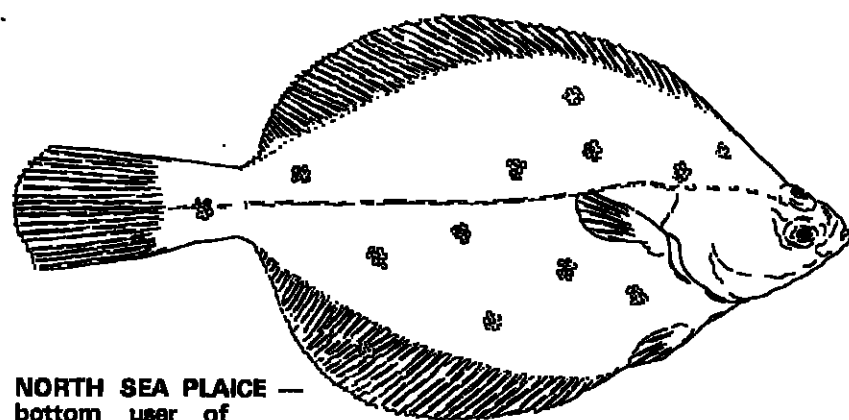


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## A 'transport' study that could help fishing

## TRAVEL BY TIDE



NORTH SEA PLAICE — bottom user of tidal transport.

RESEARCH work carried out by fishery scientists of the Lowestoft laboratory in England, shows that certain species of fish use what is called selective tidal stream transport to assist them in travelling about the ocean.

A fish will leave the bottom at slack water to move downstream in midwater on one tide and return to the bottom at the next slack with very little movement on the opposing tide.

This method of transport has already been suggested for the movement of eiders and shrimps, and one researcher has put forward the theory that soles use the technique on spawning migrations, joining the appropriate tide during night only.

According to Dr. Harden Jones and two colleagues, this could mean that, if selective tidal stream transport was kept up over several tidal cycles in the southern

North Sea, plaice would be enabled to move for substantial distances at quite good average ground speed, with lower costs in energy consumption.

According to Dr. Harden Jones, it is difficult to say whether there is any relation between the size of a fish and the distance covered during migration.

Conventional tagging experiments do not provide an answer, and the best that can be done is to look closely at the distribution of recoveries of tagged fish as soon as possible after release.

## Travel slowly

Various experiments with both cod and plaice have established no connection between size and speed, and both tend to travel slowly, although "the fish have no overwhelming hydrodynamic problems."

There are in fact two speeds: one over the ground, and one through the water. There could well be several advantages in travelling fast over the ground, such as less risk during travelling time, but there is also one main attraction attached to travelling slowly through the water. If "the power to be exerted against total drag is proportional to the square of the fish's velocity relative to water, an energy-conscious fish would therefore swim slowly."

In other words, as a fishing vessel uses less fuel steaming with the tide so a fish saves energy by using the same natural method of transportation, thus moving slowly through the water but rapidly over the ground.

## Following fish

The Lowestoft researchers used a sector-scanning sonar to follow in the open sea individual fish fitted with special transponding acoustic tags, for periods of up to 55 hours and distances of as much as 60 km.

"The ship was regularly positioned and water current measurements taken," the results suggesting that the fish were indeed "working the tides."

Assuming that the plaice behaved in this manner during migrations, the research workers reasoned that the fish should come off the bottom

**Robin Burton reports on a British project**

into midwater on south-flowing tides and return to the bottom on north-flowing tides. This theory was tested by fishing on the migration routes with midwater trawls on both northerly and southerly tides; it was found that almost four times as many fish were caught on a southerly tide than a northerly.

This should, of course, work in reverse with fish using northerly tides to return to the northerly feeding grounds.

One curious aspect was the behaviour of fish which suggested that they were keeping to some sort of flow line. The variations in which were caused by sandwaves.

A plaice has a given density, and will thus sink in water of a certain density. It has no buoyancy bladder so it has to use up a small percentage of its energy to stay in midwater.

Could it be that the plaice observed were using lift generated by water flow over a wavy bottom? Could their shape, instead of being a means of living a demersal life, be regarded as a means of "sailing" in the ocean?

## Same behaviour

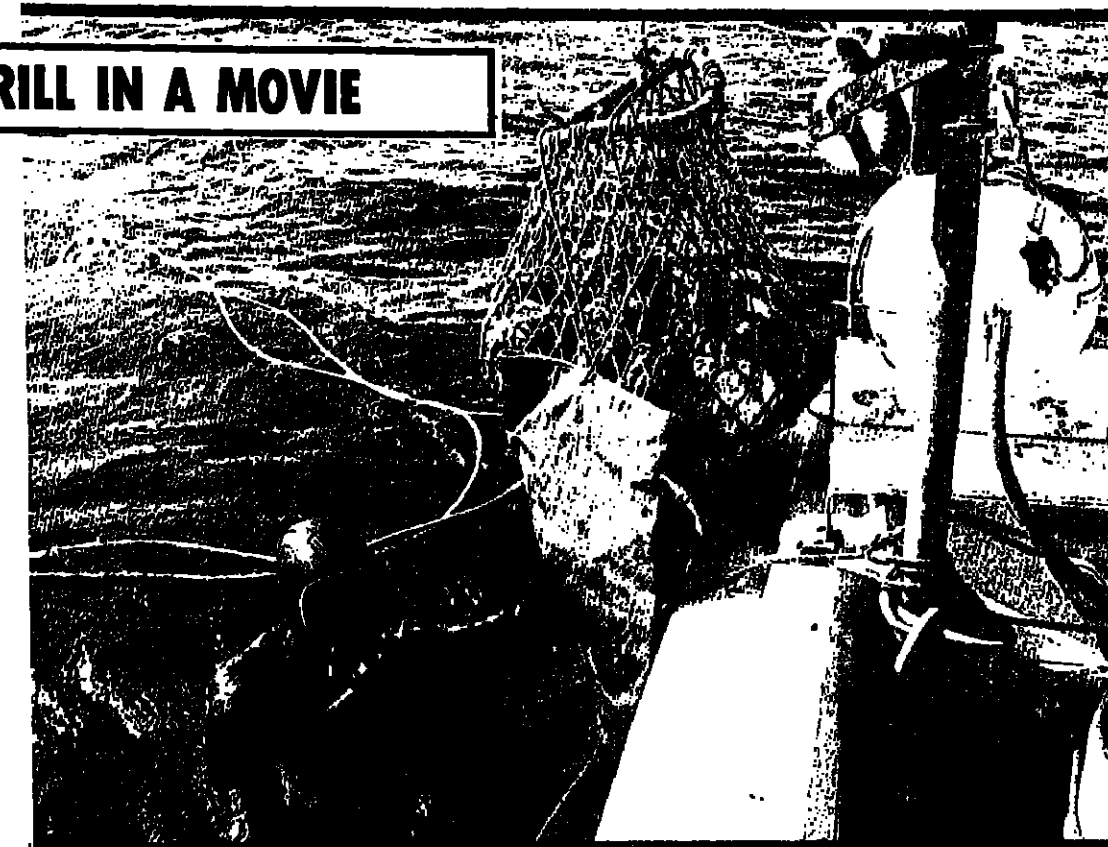
It would be interesting to know if cod behave in much the same manner as plaice. Do they also use selective tidal transport? Cod have swimbladders and thus different problems connected with swimming at different levels in the ocean. "This must pose some problems to the cod with regards to diurnal vertical migrations."

It may be true to assume, perhaps, that cod use the same system of tidal selection as plaice, if to a more limited degree, and Dr. Harden Jones says that although it has already been suggested that fish swim in such a way as to reduce the power required, he would add that some fish may have "gone one step further and that they behave in such a way as to reduce the requirement to swim."

Could it be that the movements of the fish, once charted, could become their downfall as fishing vessels are used to interrupt tidal transport? Certainly it would seem that trawls used on migrating tides stand a better chance of securing a good haul than those used on others.

## HERE, JAWS IS MORE THAN A THRILL IN A MOVIE

## Where the fisherman is in the cage!



AUSTRALIAN diver with a bag of abalone gathered on the seabed.

SOME OF the shark scenes in the film *Jaws* were shot off the coast of South Australia because the seas there are reputed to have the largest concentration of white pointers. This was the species that "starred" in the film.

But, while audiences the world over thrilled to the white pointer sequences, the real thing was haunting Australian abalone divers.

It says much for the possible earnings from successful abalone diving that a licence to harvest them in one state costs \$A26,000. Divers have been known to earn up to \$A2,000 a week. But shark attacks are a hazard of the industry.

Divers work from a runabout powered by a 75 to 100 hp outboard. Air is provided by a small compressor through about 100 metres of hose attached to a demand regulator.

Abalone are seldom found at depths below 35 metres. They are prized off the rocks by means of an iron bar. The catch is then placed in large bags which are hauled up by the diver's assistant.

## Vulnerable

At all times, the diver is vulnerable to attack. To provide some protection, South Australian divers have developed a self-propelled shark-proof cage.

This vehicle is powered by an air-driven motor connected to a 1.7 cu metre compressor by a 91 metre long 12.7 mm air hose. After many trials, the most suitable compressor for the task was found to be a Volkswagen motor with two cylinders converted.

The shark-proof cage is of welded steel and is directed by a forward mounted rudder. It operates just off the bottom.

## HOOKED!

TO TRY to improve catches taken by long lines, Norwegian researchers have been studying the reaction of cod and other species to bait and hooked lines.

The Norwegian Fishery Technology Research Institute in Bergen has been using submersible TV cameras which have shown that the fish escape far too easily from the hooks and then even run off with the bait.

As part of the tests a new hook design has been introduced. This has proved to be far more effective in retaining the fish after the initial bite.

Use of the hook has already proved its value in the form of increased catch effectiveness in long lining. But the newly-designed long line has yet to be put into production.

The problem is that long lining is employed in vastly differing geographic areas, at depths down to 1,000 metres.

Studies so far have been centred on activities off the coast of Finnmark during the summer and autumn. It is felt that the conditions in this area cannot be considered as representative.

## REPORT BY FRANK REES

Not only can divers using the cage catch more abalone; they can also stay down longer and dive more frequently. An added advantage is that they can use the cage for working in conditions — such as murky water or late afternoon — which would be hazardous for free divers.

The cage can also take much of the physical work out of abalone diving. It is self-propelled and cruises along at about three knots, and so the diver does not have to exert himself by swimming. It may also encourage divers to try deepwater areas which are presently under-exploited.

Diving into these areas requires lengthy staging at various depths for decompression, which leaves the unprotected diver more vulnerable to shark attack. There will be fewer decompression accidents because of the reduced swimming effort.

Prototypes of the new cage, known as the Ab-mariner, have been tested in commercial diving.

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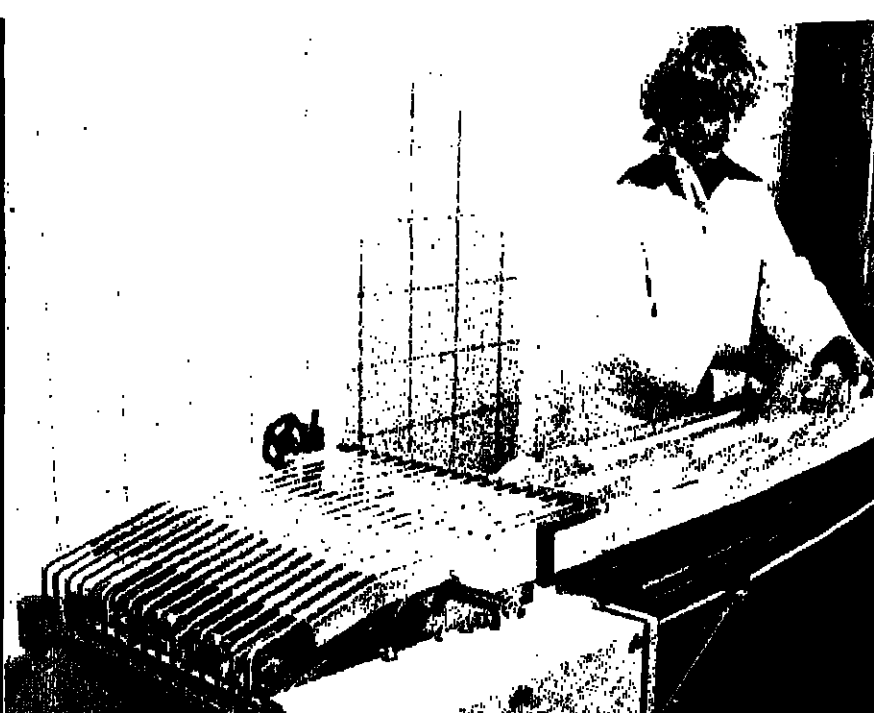
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# PELAGIC SHRIMPING

## THE REPORT

SHRIMP Midwater Trawl Development, 1977, Gulf of St. Lawrence (Fisheries and Marine Service Industry Report No. 101. See also Report 701, for 1976 trials), by Allen Tobey and Jack Rycroft.

From Technology Branch, Fisheries and Marine Service, Department of Fisheries and the Environment, Halifax, Nova Scotia B3J 2S7, Canada.

"MID-WATER trawling for shrimp can increase productivity per hour of effort by 50-100 per cent, although not necessarily increasing the number of hours that the net actually fishes."

This is the conclusion after a two-year programme of experimental fishing on the pink shrimp *Pandalus borealis* by Canadians in the Gulf of St. Lawrence. It is part of the latest report (No. 101) by Allen Tobey and Jack Rycroft of the Fisheries and Marine Service, Halifax, Nova Scotia.

It supplements — almost supersedes — an earlier report (No. 701) published last year and describing trials carried out in 1976.

Both series of tests had the same aim — to increase the productivity of shrimp trawlers by making fishing worthwhile in the hours of darkness.

Traditionally, shrimp trawlers in this region lay-to at night because catches of a bottom trawl fall off so much. This is known to be connected with the vertical migration of *P. borealis* during darkness — so why not go after them with a pelagic trawl?

### Importance

This is what the trials were about, and their eventual success has great importance wherever shrimp fisheries are affected by night time movement of this sort.

As far as the Canadian research was concerned, the intention was, not only to increase the catch, but to shorten the length of the trip from the customary eight days, which is the maximum practical period for keeping this shrimp on ice. But there was an added bonus: shrimp caught off-bottom were larger and less liable to damage from the debris which can enter the cod-end of a bottom trawl.

Pelagic-caught shrimp were also found to have a higher meat yield after peeling and to have a much better appearance.

### Differed

The second series of trials, held in 1977, differed from the 1976 series in two major respects. The earlier work was aimed at a dual trawl arrangement, using a conventional low headline bottom shrimp trawl during the day and a pelagic trawl at night. The vessel used in 1976 was the *G.C. Surcil*, a

conventional side trawler of 87 ft (26.52 m) overall and with an engine of 565 hp.

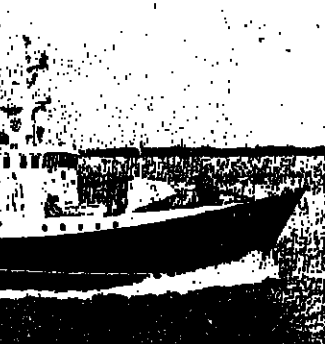
In 1977, a more powerful and more stable stern trawler was chartered, the *Scotia Cape* which has an overall length of 118 ft (36 m) and Caterpillar 765 hp engine.

### Installed

On this occasion, too, only pelagic trawling was carried out. On both occasions, however, nets, otter trawls and net drums were installed, while additional CRT equipment was introduced on the *Scotia Cape*.

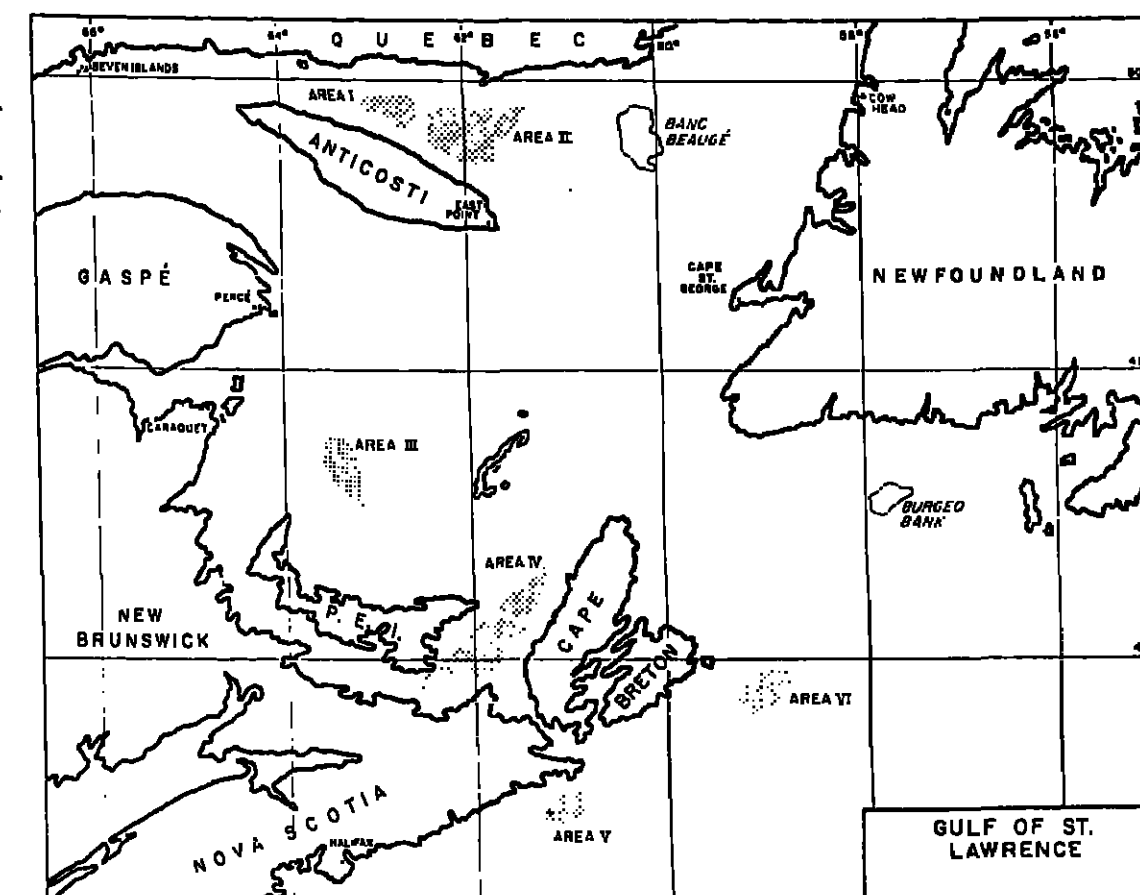
It was never suggested that this larger class of vessel was necessary in order to have enough power for pelagic trawling. The intention was to scale down the *Scotia Cape's* trawl to suit smaller vessels — or to tow a large net between two boats, one of which would carry the electro-acoustic equipment.

During 1977, some experimental fishing was also carried out in areas where



The "*Scotia Cape*" is one of four ships of this class. They were built by the St. John Shipbuilding and Drydock Company in 1967 and 1968. With a length of 38 metres, the stern trawlers are powered by 765 hp Caterpillar D388 engines.

## Canadian mid-water trawling trials to boost pink shrimp catches



shrimp had been reported by other fishermen. But none of these proved worthwhile and operations were eventually confined to the established Anticosti grounds, fishing in depths of 130-150 fathoms and making tows of up to five hours duration.

It was also hoped during these trips to establish the possible size and value of the by-catch of white shrimp (*Penaeus multidentatus*) and redfish. The latter was an

important supplement to the crew's income, but often contained many undersized fish.

### Overcome

Finally, it was hoped that two problems experienced during the previous year might be overcome — damage from basking sharks and the fact that shrimps were being meshed in the bellies.

The former, it was hoped,

might be discouraged by a large mesh netting barrier across the trawl, but this proved ineffective, reducing the catch of shrimps and creating spurious footrope echoes.

The meshing problem was thought to be the result of back-pressure within the net, caused by the restriction of water flow through the meshes. Additional netting in the trawl improved, but did not eliminate this problem.

THIS MAP shows the areas where the "*Scotia Cape*" did her test trawling for pink shrimp. Area II north of Anticosti yielded the best results — nearly 41,000 lb in eight fishing days.

**OVER—the test voyages, the gear used and the results.**

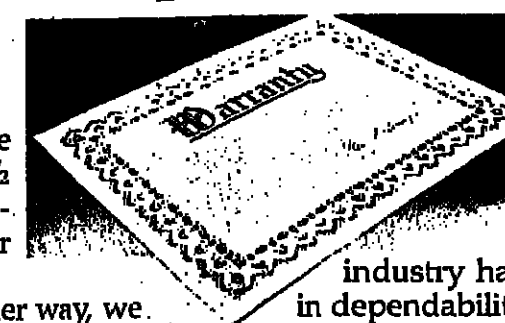
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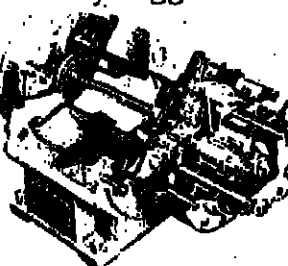
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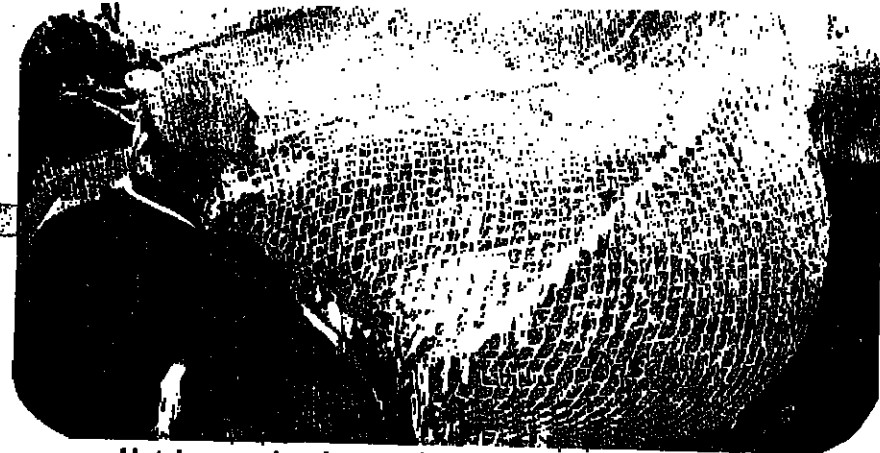
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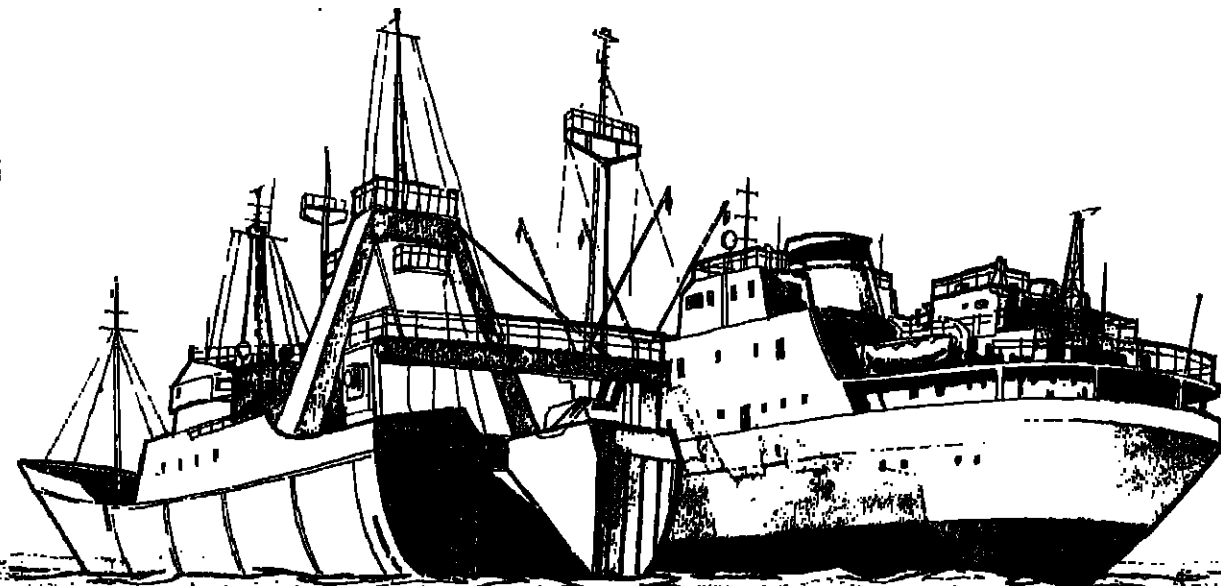
# The trials: gear,



Untying a cod-and containing about 2,400 lb of shrimp.

## IN DETAIL...WHAT TECHNIQUES WERE TRIED AND TESTED

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TWO TYPES of trawl were used initially, a 2462-mesh mid-water shrimp and a Danish three-bridle Blacksprute light pelagic. This has three inch (75 mm) mesh in the wings, with bellies reducing from six inches (152 mm) to 1½ in (32 mm) in five sections.

The wedge-shaped side sections were extended to form a third wing each side. By adjusting bridle lengths, the configuration of this trawl can be changed, taking towing strain off the top wings and allowing the headline to rise.

Light mud rollers were used to reduce bottom contact damage while still allowing the net to be wound on to the net drum.

The shark barrier mentioned on Page 47 was fitted halfway down the bellies. The second and more successful net was an enlarged version of the 1536-mesh trawl used in the 1976 trials, based on a Diamond 58 "frame." The second belly section was made of six inch meshes to the same number across as would have been the case with three inch mesh.

By omitting the side roping on these sections, the meshes were made to pull lengthwise, so allowing the passage of more water volume, but retaining shrimp.

#### Too light

The Blacksprute trawl soon showed itself to be too light for this fishery. Tear-outs were frequent and the net was not intended for use by a stern trawler. Friction on the stern rump soon chafed the knots.

The mud rollers also were a source of trouble, creating false echoes from the headline transducer, so that this net was finally abandoned in favour of the 2462-mesh trawl — though not until much fishing time had been lost in repairs and adjustments.

By the second of her seven trips, the Scotia Cape was fishing well in depths of about 150 fathoms, using 60 fathom bridles and 450 lb (245 kg) weights on each lower bridle, five fathoms from the net.

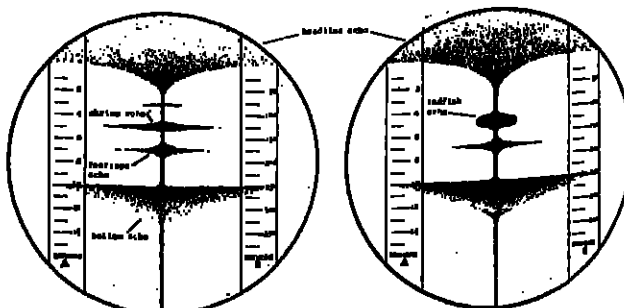
## AND THE VERDICT IS...A WINNER

Towing speed was 1-2 knots. The Shrimplupe scale expander CRT display used with the net sounder allowed the net to be fished as close as two feet from the bottom, while the Simrad echo sounder allowed rising ground and obstructions to be seen in time to lift the net over them.

It was found possible with this net to use a ¾ in (9 mm) chain tickler, 100 ft (30.5 m) long, set between the lower wing ends — a device which proved to be vital to the success of daytime fishing.

#### No damage

The chain tickler could be made to trail along the bottom, causing shrimp to jump above the bottom footrope which followed 6 ft (2 m) behind. It enabled the pelagic net to fish shrimp which were on the bottom — and without damage to the net.



Elac Shrimplupe display.

# methods, results

If the chain broke, it was easier to mend than a torn-out net. The report suggests that daylight fishing might be even further improved by the use of multiple chain ticklers.

Since fishing was so often carried out close to the bottom, it was decided to try Polyvalent doors, which are more stable than Suberkrubs when in accidental contact with the bottom. But with these it proved necessary to increase engine speed and reduce warp length to achieve the same towing characteristics.

There was also some trouble in getting these doors right up to the gallows. When the winch shaft failed, this also was thought to be due to handling the Polyvalents and the remainder of the trials were carried out using five sq m Suberkrubs.

At 150 fathoms, the echoes from shrimp were weak and the Simrad CI echo scope was able to show shrimp only in heavy concentrations and close to the bottom. As the shrimp rose with darkness, they could be detected only immediately above the bottom, before becoming too dispersed. It had to be assumed that they were in mid-water until the net was shot and the net sounder could verify the presence of shrimp — which it did very well.

#### Readout

The procedure, therefore, was to use the CI echo scope to provide a rapid digital readout of water depth, a warning of change in bottom contour and an indication of shoals of fish such as capelin and redfish. The CRT display of the Shrimplupe gave an accurate indication of footrope position and height above the bottom, also showing shrimp and redfish actually entering the net.

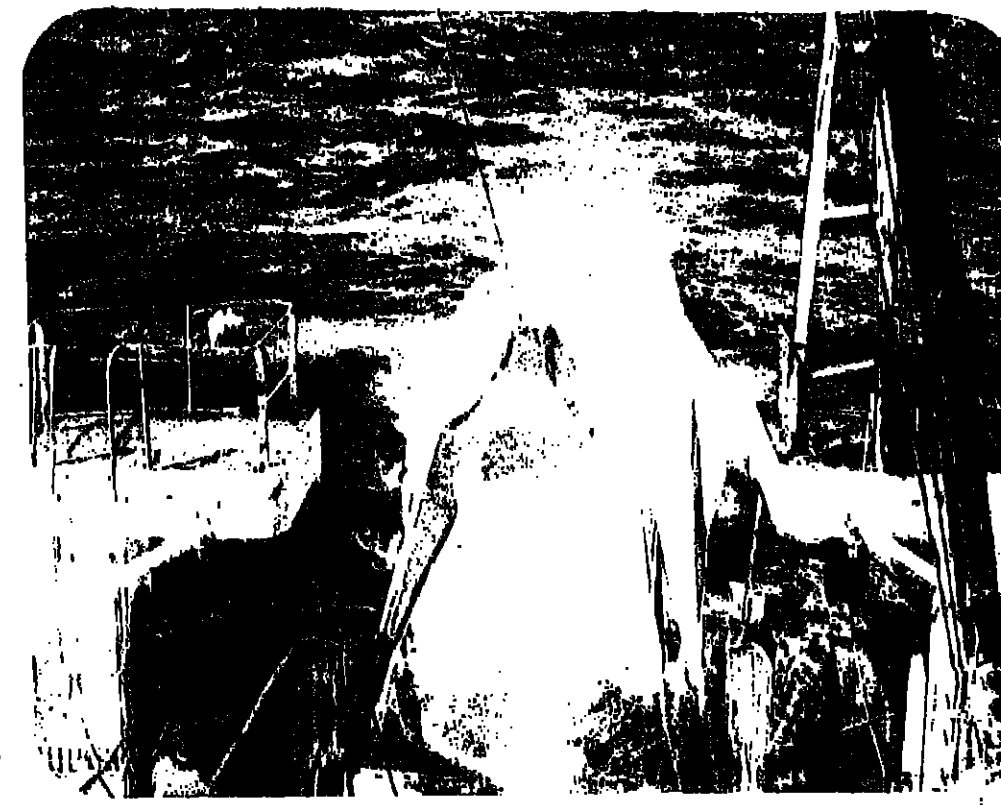
It was possible to distinguish between these two species and even to make a fair estimate of what was in the cod end.

The best trip of the series yielded 40,840 lb (18,563 kg) of pink shrimp and a saleable by-catch of 4,225 lb (1,920 kg) of redfish plus 965 lb (438 kg) of white shrimp. The 'mix' varied considerably throughout the trials and the best catches of pink shrimp were made during the latter part of the afternoon and evening, dropping off during the pelagic period after midnight and in early morning.

#### Less by-catch

A final comparison indicated that the use of a mid-water trawl not only increased fishing productivity on *Pandalus borealis*, but reduced the by-catch of immature redfish from around 30 per cent to only 2.5 per cent — though this may vary, depending on whether the skipper seeks a mixed catch as a matter of fishing policy.

The report suggests that this lower figure may be due to



The 2462-mesh trawl enters the ramp of the trawler "Scotia Cape."

the slow towing speed of 1-2 knots, which, it says, enables the young redfish to evade capture. But this does not explain why the mature redfish were still caught in reasonable quantities of around 28 per cent.

White shrimp (*Pasiphaea multidentata*) made up about three per cent of the Scotia Cape catches. But this sometimes rose to 25 per cent of the shrimp caught, depending on the area being fished. There were too many of them to be sorted on board and they therefore went through the shore plant with the pinks.

However, because their bodies are thinner, they mostly passed through the separator with the shells, the remainder being hand picked from the pink meats later.

#### More careful

White shrimp do not keep so well as pinks on ice, but it was found that more careful washing, draining and packing (in bags of less than the usual 10 lb) could largely overcome this problem.

As the count is reasonable (100-150 per lb), and meat yield is around 20 per cent, this species could become the basis of a new fishery, for the indications are that the stocks are growing in the Gulf of St Lawrence area.

Only three basking sharks were caught in the 1977 trials and they caused much less damage than in the previous year.

After two seasons' work it can be said with confidence that a practical technique has been evolved by the Canadians for improving the efficiency of shrimp trawling when shrimp rise off the bottom during darkness.

Where existing shrimp trawlers do not have the necessary power to tow a pelagic trawl, pair trawling

may be the answer, but in many cases it would be necessary to find wheelhouse space — and cash — for additional electro-acoustic equipment.

Fishing trials have continued this year (see panel) and it is to be hoped that the programme includes practicality trials of pair trawling, using existing 60-70 ft shrimp trawlers and with a view to establishing whether increased catch value would

offset the use and cost of two vessels.

It is to be hoped, too, that increased efficiency will not be used to increase landings without any decrease in trip length. Here, processors can make a valuable contribution to conservation, encouraging fishermen to bring back short trip shrimp by paying better prices for a better product.

## FURTHER TESTS A SUCCESS

ASKED about further work on the project, Allen Tobey told *FNI* last month that tests were continued during the summer of 1978.

The 2462-mesh trawl was redesigned and cut down to suit Canadian commercial shrimp trawlers of around 85 ft (25.9 metres) and 550 hp.

In the new design, he said, "the opening is more rectangular or oval rather than circular as is common for our Diamond mid-water trawls."

### Wider sweep

This was done to create a lower opening but a wider sweep.

The trawl proved very successful and catches almost doubled, those of the commercial ground trawls, with little or no small redfish by-catch.

According to Mr. Tobey, many fishermen in the Gulf of St Lawrence are interested in this method and have asked for technical assistance to carry out such an operation in future shrimp seasons.

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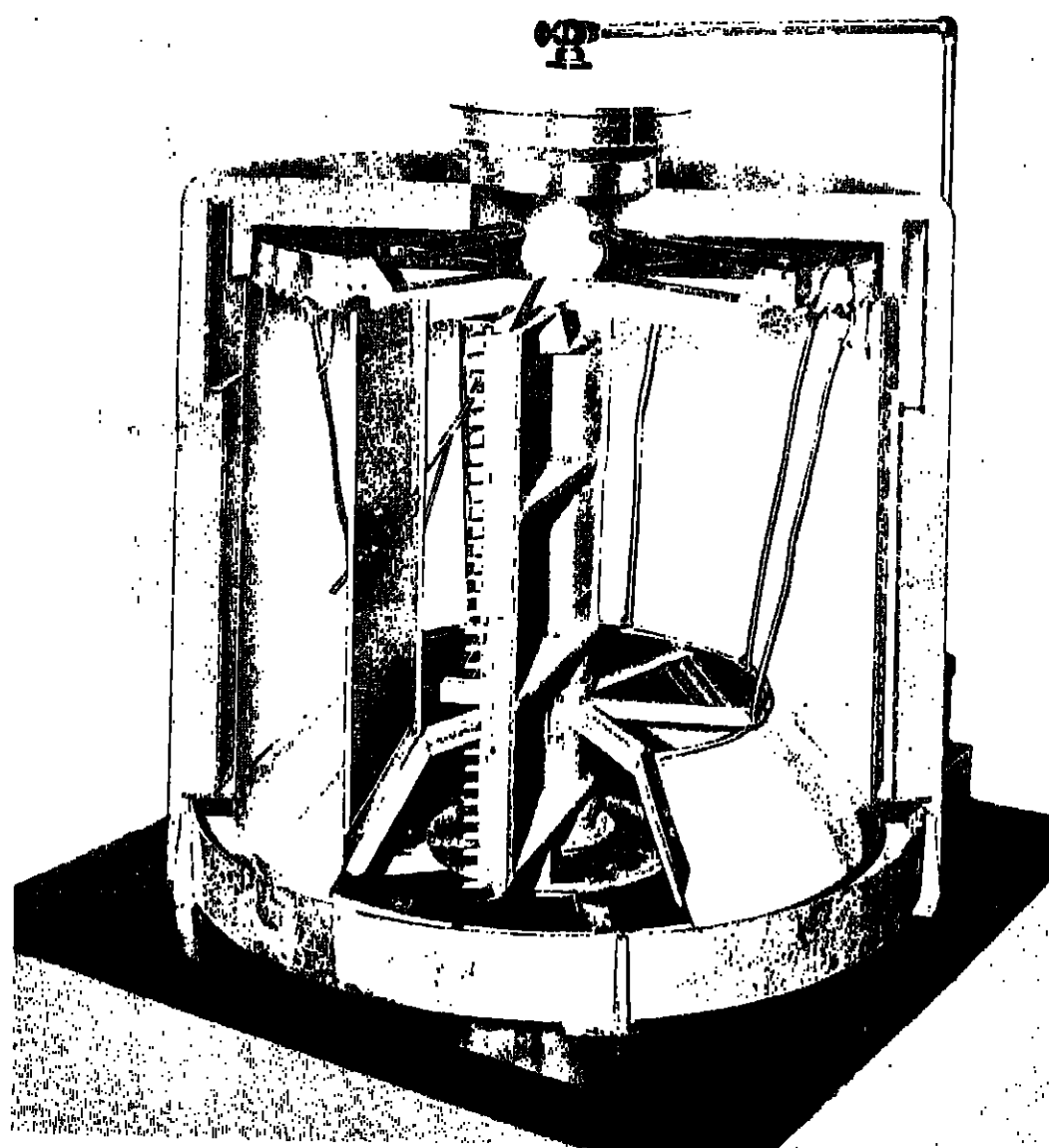
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## product news

METHODS • GEAR • EQUIPMENT  
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### Volvo Penta move HQ to Norway

VOLVO PENTA, the marine division of the Swedish car and engine maker, will be moving its centre of operations from Gothenburg to a site in Norway during 1979.

This move is the main part of a deal in which Norwegian interests are taking a 40 per cent stake in Volvo, providing new capital for the expansion of the company in Sweden.

The Norwegian Volvo plant will be located on the shores of Oslofjord. It will employ about 5,000 people and, initially, will concentrate on a new range of diesel engines in the lower horsepower range.

#### Closure

Volvo has also announced the closure by next summer of its outboard factory in Uppsala. It is not certain whether this work will also go over to Norway.

Volvo has been having talks with outboard manufacturers in Europe with the idea of

combining resources. The company's hand in these will be strengthened by a new range of compact outboards from 7 to 25 hp.

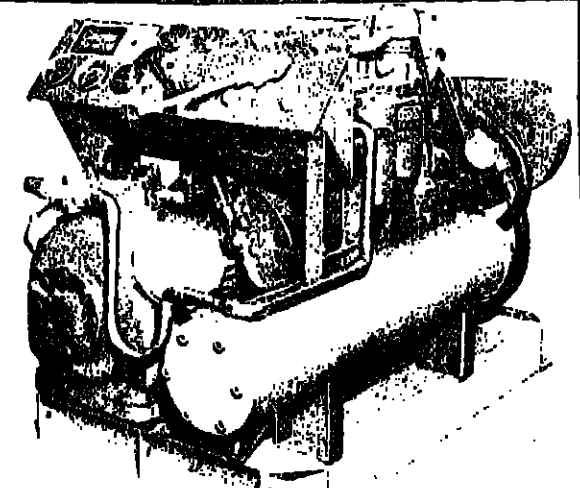
#### Economy

These are two-stroke types but offer fuel economy close to that of the four-stroke engine.

The marine side of Volvo is to place greater emphasis on servicing facilities around the world. The aim, reports *FNI* correspondent Dag Pike, is to provide a better service for customers and, at the same time, place more work in the hands of Volvo Penta dealers.

These dealers will be encouraged to enter into service agreements with users of Volvo diesels in their areas.

### NEW BOAT COOLERS



CARRIER TRANSCOLD Company of Syracuse, New York, USA, has developed a new refrigeration system for fishing boats. This Dolphin system maintains temperatures down to -20 deg F and is designed to produce 20,000 Btu/h at a fan coil evaporator return air temperature of -20 deg F.

The Dolphin has a Perkins diesel-powered condensing unit which includes the Carrier-designed OSD compressor providing 36.6 cu. in. displacement.

The unit's V-drive alternator assembly, mounted in line with engine and compressor, provides electrical power for the evaporator fan motor.

Built-in safety features such as automatic oil pressure and water temperature safety switches minimise chances of damaging equipment, says company sales manager William A. Bingham.

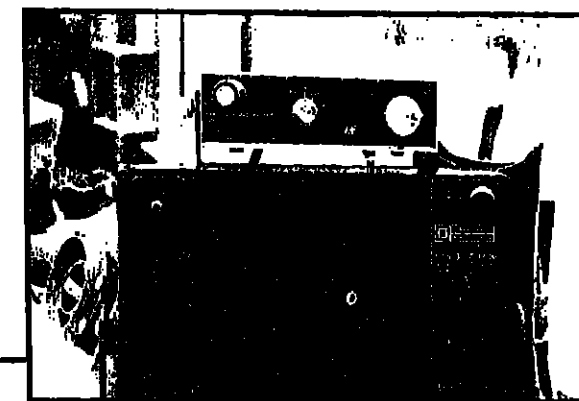
Further information about the new system from Carrier Transicold Company, PO Box 1319, Syracuse, New York 13201, USA.

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## JUST THE MARKER FOR SMALL BOATS



### How one small firm makes the grade in Sweden

THE TWO RADARS in the range produced by Electronic Laboratories Ltd., the Seascan and the Seaveyor, are designed for small craft.

There have been many demands for a variable range marker to be incorporated but this has been omitted to save costs. Now a unit is available which can be added to these sets as an optional extra.

This new unit has been developed by the Electronic Laboratories agent in Hull, Locat Developments Ltd. It comprises a small box which is normally fitted to the top of the set but which can be located remote from the radar if required. The unit is wired into the main set and connection is quickly carried out by a radar mechanic.

There are three controls on

the unit. On the left is a brilliance control to determine the intensity of the LED digital range readout. In the centre is a range scale selector which is set to the nearest point to the range in use. On the right is the range control which moves the electronic indicator on the radar screen and at the same time changes the digital readout.

#### Integral

Variable range markers greatly extend the use of small boat radars and help in collision avoidance and navigation. It is anticipated that eventually they will become an integral part of all radar sets but, in the meantime, this unit meets the requirements.

Further information from Electronic Laboratories Ltd., Fleets Lane, Poole, Dorset.



The Swedish purse seiner "Timor" is installing a new grader from the Stellan Ek factory.

A Stellan Ek herring grading machine. They are often custom designed.

ALMOST ALL the grading machines installed in Swedish herring boats come from a small family-owned factory in Taberg.

Owner of the factory and designer of the machines is former fisherman Stellan Ek

who began his business 19 years ago. He works closely with owners and fishermen ordering the machines and these are often custom-designed to suit a particular boat.

His firm also makes graders

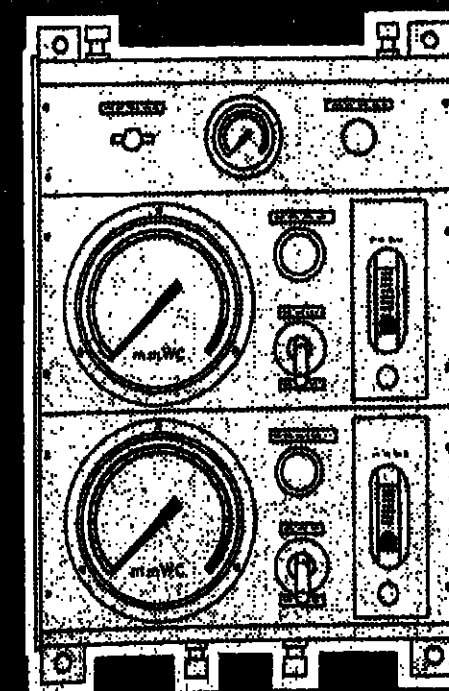
for shore plants. Most graders are used for herring, but they are also being designed for handling mackerel and shrimp.

Fish are graded into six different sizes and capacities are around 150 boxes (40

kilos) an hour. But the latest machine can grade 200 boxes an hour.

Another new development is a deck-sited machine with conveyor which is being installed in two big Swedish purse seiners.

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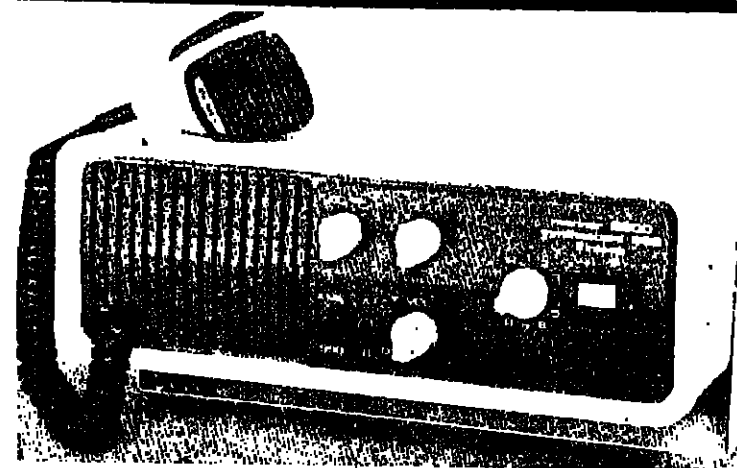
Switch on, press a button, and immediately you can read your tank levels accurately. The Peilo system operates with pneumatic pressure and is therefore completely safe. No danger of electrical fires. The Peilo system can be installed at any time and is suitable for accurately measuring the level of any liquid.

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The Mariner 2500 single sideband radio.

## THE MARINER 2500 STARTS NEW FAMILY

WITH ITS Mariner 2500, Intech Incorporated of California introduces the first of its new family of fully synthesised single sideband marine radio telephones. The set is equipped

with 23 Simplex, 11 Semi-Duplex channels plus one Simplex channel.

"Elimination of crystals or crystal changing," says Intech, "makes the Mariner 2500 the ideal marine SSB radio for wide ranging vessels."

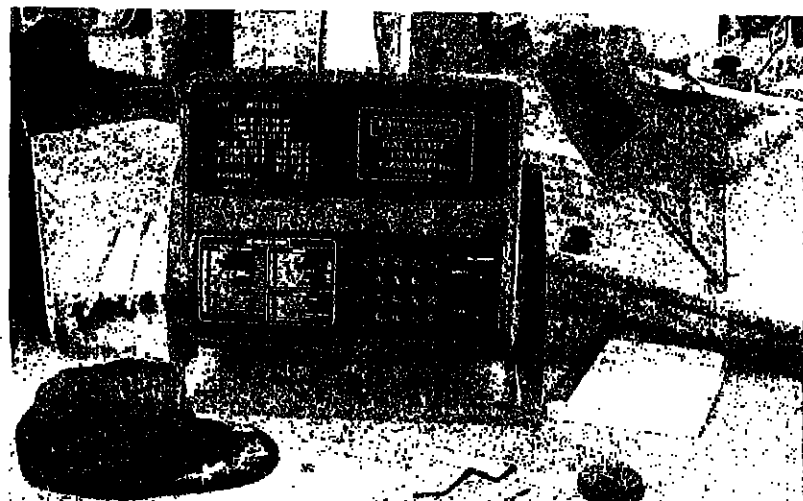
The Mariner 2500 is of all solid-state design and is housed in a tough anodised finish aluminium chassis.

It has a dual 50 ohm antenna output connector compatible with an automatic antenna coupler so that a variety of whip or long-wire antennas can be used.

Power output of the Mariner 2500 is 125-watt PEP. Deliveries are scheduled to begin in early 1979.

Further information from Intech Incorporated, 282 Brookway Road, Santa Clara, California 95050, USA.

## Omega made useful. Satnav made better. The MX 1105.

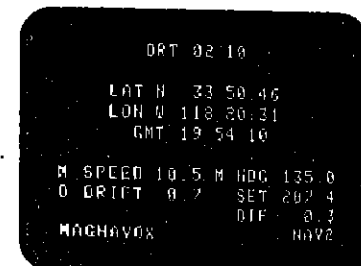


It's no secret. Stand-alone Omega has some bugs. And Satnav, the most reliable all-weather system available, still requires dead reckoning between fixes.

So we've taken the best of two worlds to improve the performance of each. The result is the MX 1105 Satellite-Omega Navigator.

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The MX 1105 gives you redundant references — the accuracy and all-weather reliability of Satnav with the continuous-fix capability of Omega. Con-



### Omega That Works.

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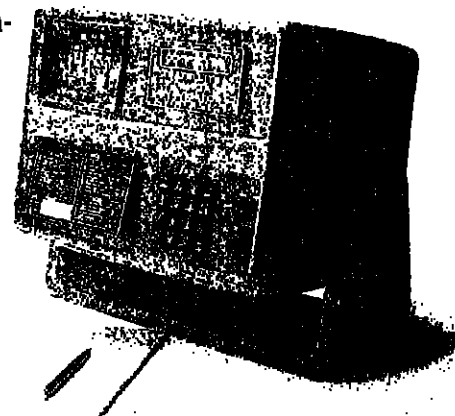
rate fix data even during long-term ionospheric disturbances and polar cap anomalies.

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## A WHALE RISES IN ORKNEY

THE ORKNEY GRP boat-builder Halmatic (Scotland) Ltd. has changed its name to Orcanitic Ltd. To highlight the new name, a company symbol has been designed, showing Orca the whale rising from the sea.

The company was re-organised last year and has since introduced new vessel designs, increased its workers and brought in new skills. In October, the fitting-out operation was moved to a new building where five or six vessels can be completed at the same time.

Last month, the Orcanitic order book included three 36 ft., one 29 ft. and three 24 ft. "Skeries" boats, two of which were for export.

Considerable interest is also being shown in the company's 54 ft. boat and one will be delivered soon to a fisherman on the west coast of Scotland.



SINCE ITS introduction six months ago more than 150-ton of MacAllister Marley Mix have been sold. This cement mortar was developed for constructing ferro-cement boats. It consists of a combination of carefully graded sharp sands, combined with Blue Circle Portland cement.

Mortar is the single most critical item in a ferro-cement hull and this mix is designed to take the guesswork out.

MacAllister Ferro-Mix has been used for the hulls of two 13-metre fish carriers building for Guinea Bissau and is also being used in the hulls of a pilot scheme to develop ferro-cement fishing canoes.

## product news

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## Lobster holding system expands

THE LOBSTER storage system installed at Fleetwood fish market in England has been expanded by Shellfish System Ltd. This trebles the capacity of the storage at the premises of David Towne, one of the market's leading merchants.

The storage system is built on a modular basis which allows the maximum storage capacity in the minimum space. Sections of the system can be closed down for cleaning or maintenance without disturbing other sections.

Lobsters are held in 18 GRP storage tanks each 9ft. long by 2 ft. wide. The tanks are mounted on a tubular steel frame which is made corrosion resistant by a PVC covering. They are mounted above the three reservoir tanks.

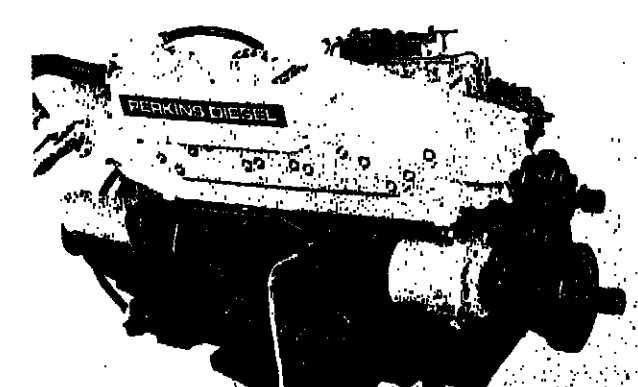
### Electric pumps

Duplicated one hp electric pumps circulate the fresh water which contains dissolved salts.

If there is a complete power failure, all tanks will drain into the reservoir which will ensure the survival of the lobsters for several hours.

A stainless steel cooling coil is installed in one of the reservoir tanks. This is coupled to a refrigeration compressor which is designed to maintain the circulating water at a temperature of around 8 deg. C. A comprehensive alarm system developed by Shellfish Systems gives warning of low water level, high temperature or pump failure. If one pump should fail the other pump automatically takes over the load.

## PERKINS DEBUT



Naturally aspirated version of the Perkins Range 4 series.

PERKINS DIESELS chose the Southampton Boat Show to introduce a new range of marine engines based on a six-cylinder model.

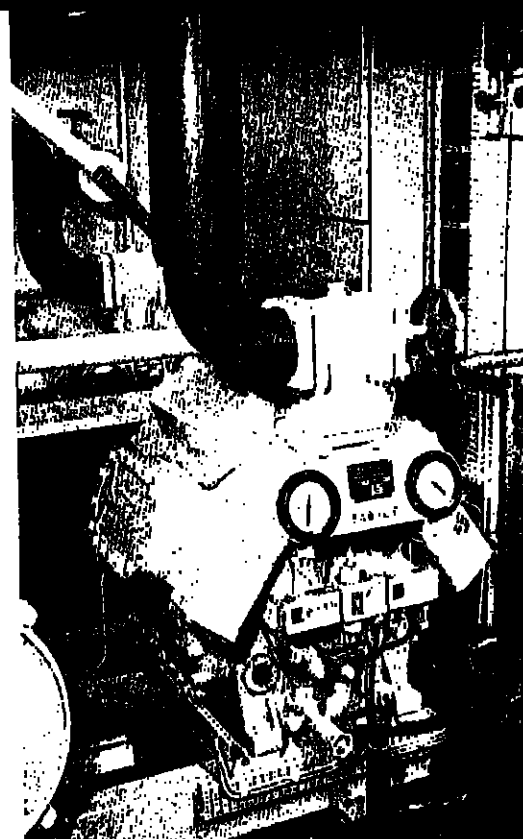
Although the basic engine is common to all the new models, power outputs range from 98 hp to 185 hp.

The new range has been developed to meet the require-

ment for better fuel economy, greater durability and higher power outputs.

There are four models in the range. The engines can be rated at different powers to suit the application, with only the basic model, the 6.354, being available for heavy commercial duty, where it is rated at 98 hp at 2,000 rpm.

## Danish ship's RSW system



Sabroe refrigeration unit in the Marie Polaris.

THE NEW DANISH trawler-purse seiner *Marie Polaris*, described in *FNI* in October, has a capacity for 1,200 tons of fish and waste and has a refrigerated seawater (RSW) system supplied by Sabroe.

Her RSW system consists of six tanks with a total capacity of 700 cubic metres together with an automatic Sabroe R22 plant to cool the seawater. This is made up of two identical but separate refrigerating units each with a Sabroe type SMC 108S compressor, CSTM marine condenser, receiver, drier with by-pass and seawater cooler. While the ship is moving in

North Atlantic waters, the two compressors will be able to cool 115 tons of seawater from 15 deg. to 0/-1 deg. C in five hours. After the temperature can be maintained by one compressor.

Cooling of the seawater is done in two horizontal shell-and-tube type coolers which can be connected to each of the RSW tanks by a valve system. Seawater is circulated by two pumps, the pressure sides of which are connected with the coolers via filters.

Water is sent through valve systems under pressure to distribution pipes at the bottom of the tanks. It passes up through the tanks and is up to the tank top and back.



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## VEGA ON BOARD SCALE 6010

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No knives or bearings under the weighing platform

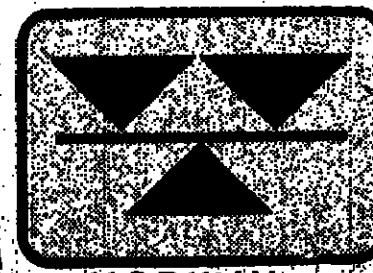
In VEGA ON BOARD SCALES, the knives and bearings under the weighing platform are replaced by horizontal stainless steel straps giving accurate readings with minimum maintenance.

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## Bangladesh



A boat brings her fish to the water's edge at Cox's Bazaar, where Bangladesh has a new fish market building.

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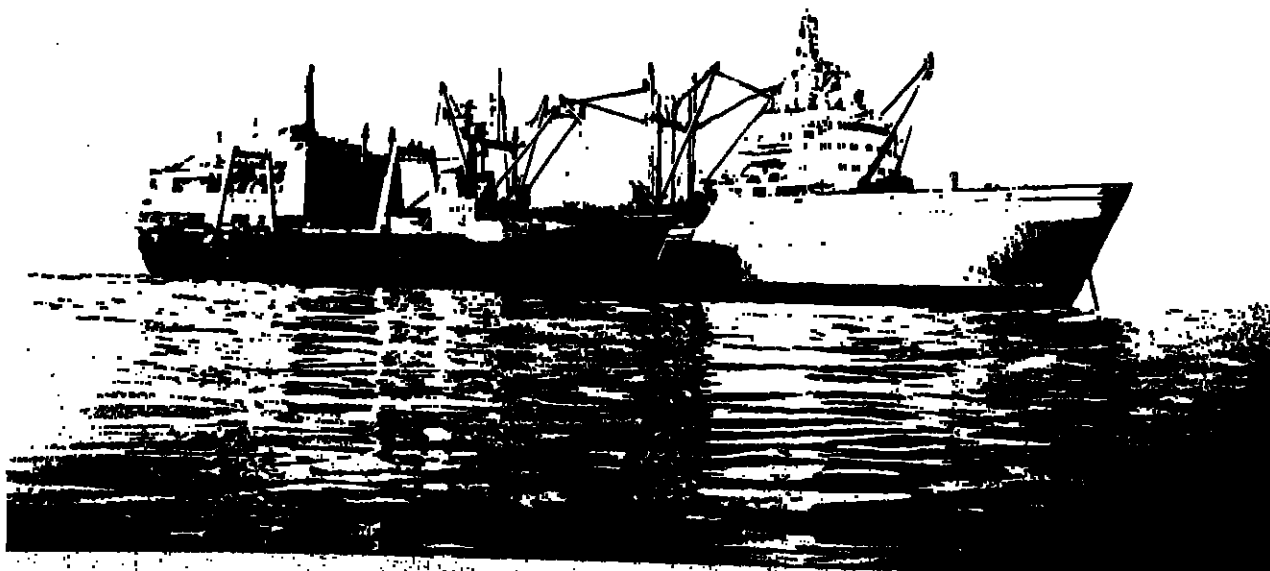
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## New promise in marine fishing catch is estimated to have doubled in a decade

# HOPE AT LAST FOR A BETTER LIFE

BANGLADESH, approached through the estuarine labyrinth of the mighty Brahmaputra and Ganges rivers (ending as the delta of the Ganges); seems to have been created for fishermen to make a handsome living, with more water than land in sight.

And it is the home of people who live mainly on fish so far as animal protein is concerned — the 80 million of them consuming more than 10 kg per person per year. Bangladesh, formerly East Pakistan and before that East Bengal, shares with India's West Bengal a taste for freshwater fish and by far the biggest part of the country's fish production comes from the vast area of waterways.

However, in recent years there has been a substantial increase in the marine catch which is now estimated to exceed 100,000 tons a year — about twice as much as was landed a decade or so ago. Even so, the inland waters catch is several times greater.

(I should mention that all the figures given here are tentative as there are no reliable statistics of catch and consumption).

My chief interest in a recent visit to Bangladesh was to see what was happening in marine fisheries, especially in view of the encouraging reports of the potential for such fisheries in the Bay of Bengal.

The silt carried into the sea by the Ganges and Brahmaputra rivers stretches for dozens of miles into the Bay.

But, although to outward appearance the prospects for marine fishing are so encouraging, development of the fisheries has been hampered by climatic conditions, mainly in the form of destructive cyclones which roar in from the Bay of Bengal, ravaging the country with winds and floods, destroying the fishing villages and shore facilities and killing thousands of people.

### Pressing

Yet, despite such forbidding difficulties, the need to develop marine fisheries is pressing as Bangladesh's vast and rapidly increasing population is ill-fed, being in particular short of protein and calories.

The mass of poor people get only about 40 per cent of protein requirement a day and about 54 per cent of calorie requirement. Of the protein intake, only 7.5 grams a day is from animal sources, and of this some 87 per cent is from fish — which is a measure of the importance of fish to the people of Bangladesh.

Another important aspect of the country's fisheries is that about 95 per cent of the catch is landed by the small-scale sector. It is estimated that there are more than 150,000 full-time and over 90,000 part-time fishermen in this sector.

The main marine fishing season is from mid-September to mid-April and employs about 9,500 vessels. Of these,

REPORT AND PICTURES BY

**Cedric Day**

only about 1,200 are mechanised but the drive for mechanisation is being intensified. Many fishing methods are used, depending on the craft and gear available. Most of the fishing I saw was done with gill and stake nets, purse seines, long lines and spears.

Fishing generally is conducted at the artisanal level with very little in the way of shore establishments and facilities. Indeed, there are only four main fish landing terminals — two at Cox's Bazaar and one each at Khulna and Chittagong.

Mostly, fish for home consumption are eaten fresh and are not iced. The catch is roughly handled without attention to hygiene, but fish for export are iced and frozen and handled with more care.

The effort to improve the handling of fish was apparent at the first place I visited, the new fish market at Cox's Bazaar.

### Cleanest

It is, perhaps, the cleanest fish market in south-west Asia and is, to that extent, a "show piece." It has an ample supply of fresh water to sluice down the concrete floor of the open-air auction room but, unfortunately, the floor is not

sloped to drain off the water and waste.

As the market is situated at the water's edge the fish can be easily off-loaded by basket to the market floor. It is a busy place through which pass 15 to 20 tons of fish daily.

I talked to many fishermen, traders and workers at Cox's Bazaar and many other places and concluded that most of the country's fishing industry — that is to say, the commercial mechanised sector, not the local small, scattered artisanal fishermen — is in the hands of the richer fishermen and traders.

### Contract

These are often the one and same, a fisherman/trader who owns several boats and employs fishermen under contract. The men are paid 30 to 50 takas (1 Tk equals 0.65 US\$) a month, provided with food on board and allowed two weeks holiday a year.

Such a contract provides a measure of security in a poor society where unemployment is rife, as the fisherman/trader

sends the men to fish in big inland waters when the marine fishing season is over.

There are, of course, variations of this type of contract, including one under which the men get a lower wage but have a share of the catch. But the end result seems to be much the same — a take home pay of 30 to 50 Tks a month.

### Rent

More enterprising fishermen rent vessels. From talks with a number of them, I concluded that they earn more than those who work under contract — twice as much or even more when fishing is good. I also found that fishermen working their own boat, singly or in partnership, make more than those employed under contract.

While these earnings may seem very low they have an acceptable economic place and value in a country like



Small-scale fishermen work their nets from a sail boat near Dacca.

Bangladesh because of local conditions, living standards, the cost of living and the fact that work is hard to get. The situation was put into

perspective for me when I met a group of men and boys squatting in the dust, repairing nets. Although they were "born fishermen" they were

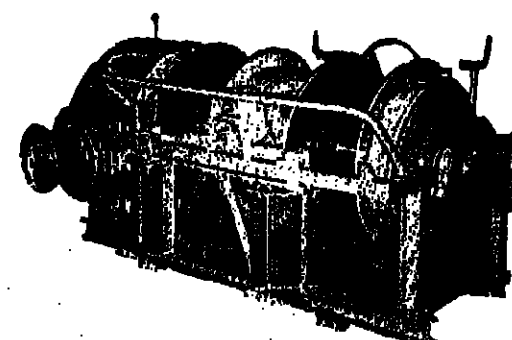
too poor, they told me, to be able to buy twine to make nets for themselves or to rent a boat so they have to scratch a living, earning a few takas by

mending nets for other fishermen.

Their leader said: "If we could get nylon twine we could make nets and go fishing so that we could have fish to eat and earn enough money to buy other food and clothes."

## NEXT MONTH: An experiment in co-operation

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<p><b>LARGE-SIZED DELUXE ECHO SOUNDERS</b> MODELS 1801 AND 2002</p> <ul style="list-style-type: none"> <li>•Roll paper: 204 mm x 20 m</li> <li>•Trawl (12) depth range</li> <li>•Continuously variable from 12mm (0.6") to 12mm (0.8") per minute</li> <li>•Bottom line &amp; BTC controls</li> <li>•Magnetic keying</li> <li>•Operable at any voltage between 10.8 and 48 VDC</li> <li>•Transducer Model 2001 or 2002</li> <li>•Model 2001: 8000 ft. 21" x 21" Model 2002: 2000 ft. 21" x 21"</li> <li>•Transducer power: Approx. 800W for model 2001 Approx. 800W for model 2002</li> </ul>	<p><b>MEDIUM-SIZED DELUXE ECHO SOUNDERS</b> MODELS 1802, 1803, 1804</p> <ul style="list-style-type: none"> <li>•Roll paper: 180 mm x 20 m</li> <li>•Trawl (12) depth range</li> <li>•Variable paper speed and pulse length controls</li> <li>•Bottom line &amp; BTC controls</li> <li>•Magnetic keying</li> <li>•Operable at any voltage between 10.8 and 48 VDC</li> <li>•Transducer Model 1801 or 1802</li> </ul>	<p><b>GENERAL PURPOSE ECHO SOUNDERS</b> 185- &amp; 184-MINI SERIES</p> <ul style="list-style-type: none"> <li>•Chart size: 180 mm x 10 m</li> <li>•Variable chart speed</li> <li>•Bottom line &amp; BTC controls</li> <li>•Transducer: 185 or 184-MINI, 21" x 21" for 184-MINI</li> <li>•Transducer power: 400W</li> <li>•Operable at any voltage between 11 and 48 VDC</li> </ul>	<p><b>RECORDED-FLASHER ECHO SOUNDERS</b> 707-MINI SERIES</p> <ul style="list-style-type: none"> <li>•Roll paper: 180 mm x 18 m</li> <li>•Paper clutch for flasher operation only</li> <li>•Bottom line control</li> <li>•Magnetic keying</li> <li>•Eight (8) depth ranges</li> <li>•1000V power</li> <li>•BTC &amp; Bottom line controls</li> <li>•Variable chart speed</li> <li>•Voltage: 12-48V</li> <li>•Transducer: Barman-Tyler 5000 ft. 21" x 21" Model 707-A/B: 2000 ft. 18" x 18" Model for model 707-C/D</li> </ul>	<p><b>SMALL-SIZED DELUXE ECHO SOUNDERS</b> MODELS 1805 &amp; 1807</p> <ul style="list-style-type: none"> <li>•Roll paper: 180 mm x 18 m</li> <li>•Available in 5000 ft. model covering 8 depth ranges and 2000 ft. model covering 12 depth ranges</li> <li>•Paper speed: Model 1805: 2000 ft. 21" x 21" Model 1807: 2000 ft. 21" x 21"</li> <li>•Transducer: Barman-Tyler 5000 ft. 21" x 21" Model 1805: 2000 ft. 18" x 18" Model for model 1807: 2000 ft. 18" x 18"</li> <li>•Paper model is also available</li> </ul>	<p><b>WEATHER CHART FACSIMILE RECORDER</b> MODEL FR-10</p> <ul style="list-style-type: none"> <li>•Horizontal and continuous scanning system</li> <li>•Scanning speed: 80-120 rpm</li> <li>•Scanning delay: 5 lines per min.</li> <li>•Roll paper: 270 mm x 80 m</li> <li>•Chart reduction rate: 3/4</li> <li>•Wider of cooperation: 57/2</li> <li>•Power: 12-48 VDC or 110VAC</li> <li>•Power consumption: 85 VA</li> <li>•Power supply system</li> <li>•Power range: 2-4, 4-10, 10-17 m</li> <li>•Sensitivity: 2-4, 4-10, 10-17 m</li> <li>•Storage: 2-4, 4-10, 10-17 m</li> <li>•Tuning indicator: By speaker</li> <li>•Crystal rectifier: 12 sockets on the front</li> </ul>
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# FISHING FROM 400 VILLAGES

## INDIA'S ANDHRA PRADESH STATE NEEDS MORE POWERED BOATS

The state's fish industry produces 250,000 tons a year, but facilities for the village fishermen and their families are still woefully inadequate, despite efforts already made.

THE Indian State of Andhra Pradesh, with a population of more than 44 million, has a coastline of almost 1,000 km on the Bay of Bengal and a fish production of about 250,000 tons, of which 155,000 tons are harvested from the sea.

In population, coastline — it has a continental shelf area of more than 30,000 sq km up to 200 m depth — and in fisheries production, therefore, the state compares with many European and other countries, reports *FNI* correspondent CEDRIC DAY.

more than 1,100 people, of which around 650 are professional officers. More than 1,000 of the staff are stationed in the rural areas.

Progress has also been made on the industrial side. The Andhra Pradesh Fisheries Corporation Ltd., was set up in 1974 to operate boat building yards, shore facilities, ice plants and cold storages, a canning plant and the trawlers of the Directorate of Fisheries.

An assessment of Andhra Pradesh's fisheries has been carried out recently by the staff of the FAO/UNDP project on Development of Fisheries in South-west Asia, with the co-operation of the national and state fisheries departments. The resulting report is not an official FAO or government of India document. But it is an interesting and practical guide to the fisheries situation in the state, particularly as to development needs and potential.

There are more than 400 fishing villages along the Andhra coast from which the fishermen operate, using some 15,000 catamarans, 2,000 "marsulas" (Plank stitched craft) and 1,000 "navels," curved boats built of teak. It is estimated that there are only a few hundred mechanised vessels but an increasing number of shrimp trawlers are operating from the harbours at Vizakhapatnam and Kakinada.

### Traditional

The great bulk of the fish landed is thus caught by the fisherman operating with traditional craft. This is true of the shrimp and other catches as well as of fish, both demersal and pelagic.

While the potential for the state's fisheries is encouraging, several factors are unfavourable to development, such as the isolated locations of the villages and the low caste status of the fishermen who are numbered among the socially and economically backward sections of society. Infrastructure facilities for helping to improve the living standards of the fishermen and their communities are woefully inadequate. For example, even such essentials as clean water supplies and roads are lacking in most areas.

Efforts have been made over the past two decades or more to improve the fisheries situation in the state. A Directorate of Fisheries was set up in 1959. It now employs

more than 1,100 people, of which around 650 are professional officers. More than 1,000 of the staff are stationed in the rural areas.

### Demand

A freezing plant started operation at Vizakhapatnam in 1976. It can freeze four tons of "shrimps" daily. The Corporation exported about 180 tons of shrimp in 1976-77, mostly to Japan and the United States. In view of the increasing demand, a second freezing plant of similar capacity is to be installed, this one at Kakinada.

The Corporation operates ice plants at Vizakhapatnam, Nellore, Padala and Hyderabad and is opening a new 10-ton daily capacity plant at Kakinada. A cannery has also started production at Kakinada and a fishing gear unit has been set up there to make gill and trawl nets.

### Untapped

As the FAO working paper points out, exploration of the state's fishery resources through various surveys indicates substantial untapped or under-exploited resources of thread-fin breams, sharks, rays, catfishes, etc.

There are also indications of good potential resources of pelagic species, particularly Indian mackerel. The extent of the potential for fisheries development in the state is indicated by the estimate given, based on surveys so far undertaken, that the present marine catch could be at least doubled. But to achieve this, much needs to be done by way of material and technical support, and in training, extension work, marketing, provision of credit for fishermen, and other services.

## Bank aid for fishery study

THE ASIAN Development Bank is to provide a technical assistance grant to the government of Pakistan aimed at boosting exploitation of the country's fish resources.

This grant will cover the foreign exchange cost of a feasibility study by nine experts who will work with government staff and local consultants.

In the team will be specialists in fishery institutions and management, fishing operations, shore plant and marketing, aquaculture, fishery economics, and port engineering.

The study will also look at the need to augment earnings from fish exports and to make more fish available to local consumers. Aspects which the team will examine include mechanisation of coastal small-scale fisheries;

a pilot scheme for offshore purse seining and/or long lining for tuna; exploitation of demersal species by offshore trawlers; improving Karachi's fishing port; setting up a new fishery harbour in the Korangi Creek area near Karachi; establishing a GRP or ferrocement hoatyard; and developing inland fisheries and farming in the provinces of Sind, Punjab and the North-West Frontier.

Under its Fifth Five-year Plan to 1983, the Pakistan government sees fisheries as important to help improve dietary standards of the rural population.

The Asian Bank earlier provided a loan of US\$6.73 million to the Agricultural Bank of Pakistan to fund the foreign exchange cost of marine diesel engines, fishing gear and other items for the Fisheries Development Project. Some 400 boats equipped through the loan are now in operation.

## Survey off Sri Lanka

THE SEA around Sri Lanka has big fishery resources. Properly tapped, these could greatly contribute to the economic development of the country, said Gunnar Sætersdal (pictured right), Director of the Institute of Marine Research in Bergen, Norway.

Mr. Sætersdal was speaking

at a press conference aboard the research ship *Dr. Fridtjof Nansen* in Colombo port. The ship arrived in Sri Lanka after carrying out fish surveys in the north-west Arabian Sea.

She is now engaged in survey work around Sri Lanka.

According to Mr. Sætersdal,

the findings of the survey will help Sri Lanka assess the potential of her fish resources and provide the information for decisions on types and sizes of vessels and shore facilities.

It will help identify new grounds and also contribute to what has already been learnt about known areas.

## Mozambique gets trawlers from USSR

SOVIET refrigerated trawlers have been acquired by Mozambique and are expected to begin operating soon. Initially, they will be manned by mixed Soviet and Mozambique crews but eventually local co-operatives will take them over. Two co-ops were recently set up in Maputo.

### Scientists

Soviet scientists have participated in research surveys off the Mozambique coast. Recommendations resulting from voyages by the research vessel *Aelita* have already been passed on to local fishery officials and fishermen.

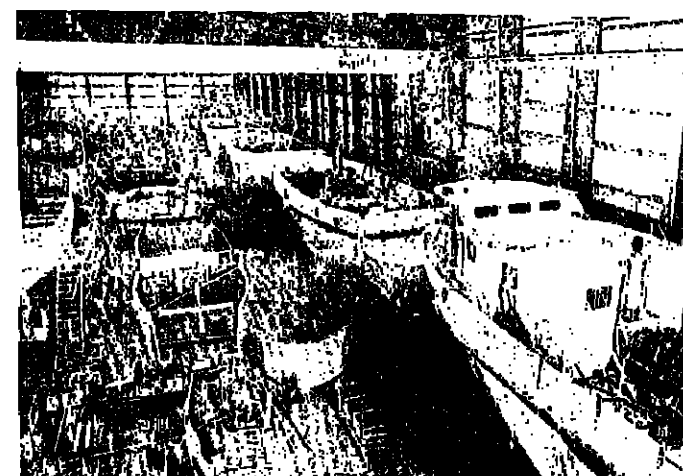
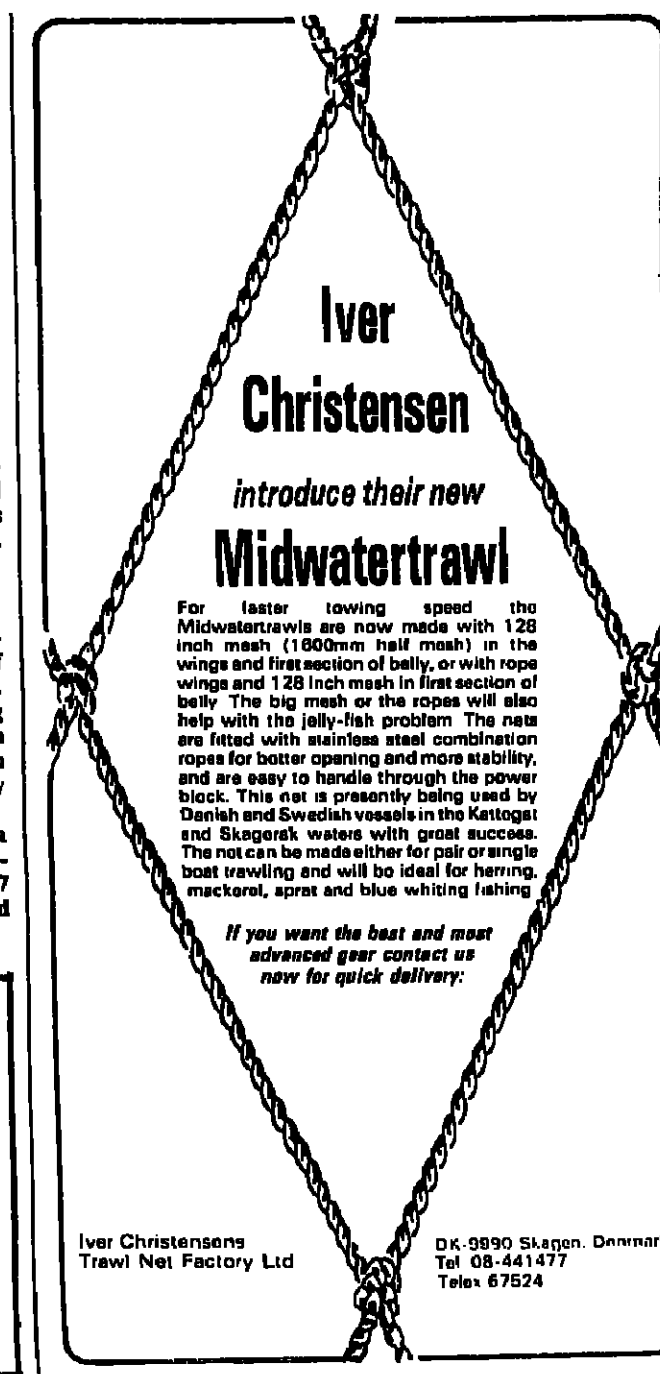
The USSR also has a fisheries co-operation agreement with Angola and in 1977 some 30,000 tons was handed over from Soviet ships.



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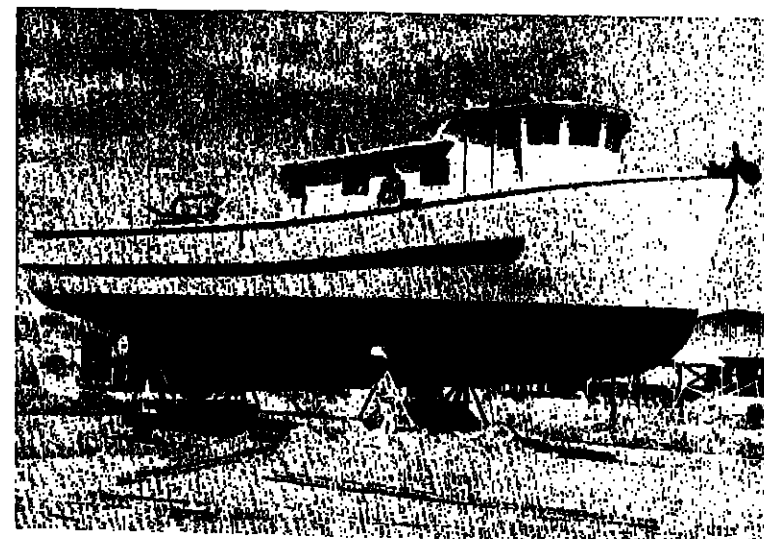
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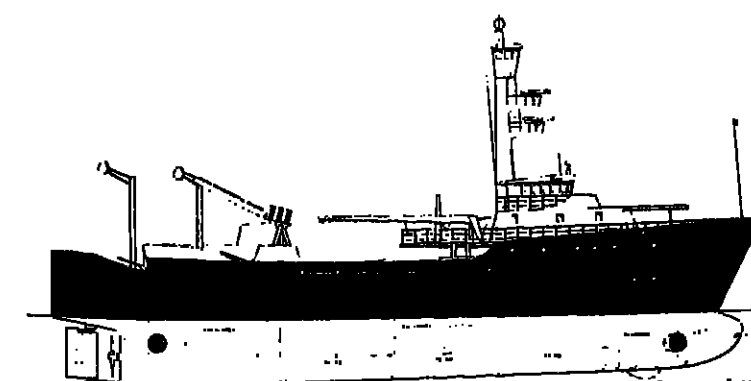
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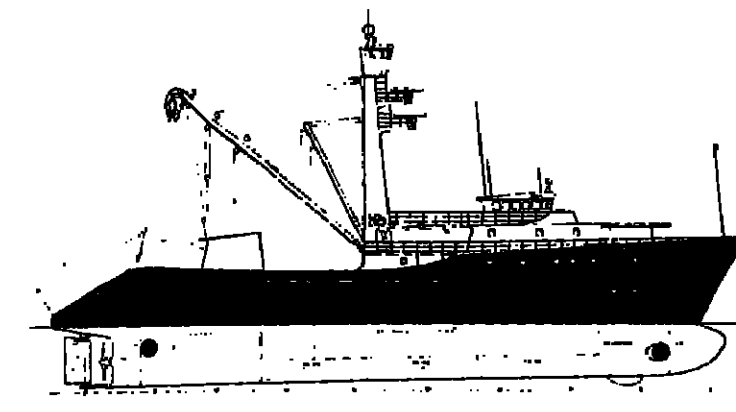
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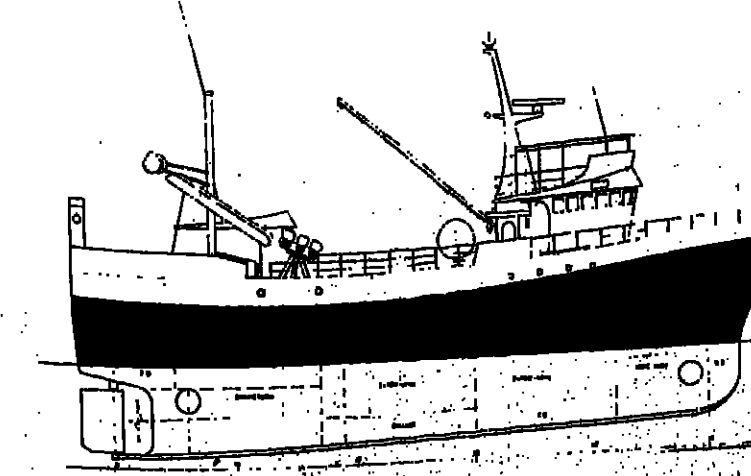
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# Changing views on the resources . . .



## Multispecies fisheries

IT IS BECOMING increasingly evident that man's concept of nature has been well adrift for a good many centuries. Both on land and at sea, we are being reminded — often forcibly — that no species of plant, animal or marine creature can be regarded in isolation. Each is part of a total ecology which was probably in a state of balance before man came along with his sledgehammer approach and ruined nearly everything.

The effects of the new thinking are widespread, ranging from the conservation of apparently insignificant insects and plants, to campaigns for saving the whale and the seal, and in 1977 a consultation of experts under the aegis of FAO to discuss the problems of multispecies fisheries.

A useful example of such a fishery is ICNAF Sub-area 5, which includes Georges Bank, and which, with the Gulf of Thailand trawl fishery is the subject of discussion in this FAO Technical Paper 181.

Within recent years, the Georges Bank grounds have changed their character from being mainly fished for cod, haddock, silver hake and herring — which they still are — to include a number of hitherto neglected species such as squid, skate, argentine and mackerel. The take of herring, hake and flounder has risen sharply as that of haddock has declined seriously.

### Practice

Fairly obviously, the traditional practice of carrying out stock assessments of single species in isolation is no longer valid as a means of forecasting abundance and

Above: A mixed bag aboard a North Atlantic trawler. Stocks can no longer be considered in isolation.

Left: Trawler catch in the years of plenty on the Georges Bank. Stocks were badly depleted by foreign fishing, but may now be restored under the coastal state 200-mile regime.



Soviet factory mother ship and trawler on the Georges Bank in the big years of foreign fishing there. Ships such as this can switch from area to area and species to species.

controlling the stock. Even when warnings have been accurate, they have often been ignored until too late.

Fisheries such as the Banks changed in character from being carried on mainly by the coastal state for a limited number of species to being dominated by vessels of greater size, number and catching power, flying the flags of many nations.

These vessels fish for species hitherto ignored and their by-catch of other species has reached a level at which it enters very much into stock statistics.

But what cannot enter into statistics at our present state of knowledge is the effect of man-made and natural stock variations on factors such as competition for food and natural predation, be it of eggs, larvae or adults.

The past 20 years have also seen the advent of the purse seiner, which can fish a stock faster than the biologists can monitor it. Another new factor is the ability of a large foreign fleet to swing from one species to another when catches fall off.

### Prediction

It seems we have now to consider the total biomass in our predictions, and not just those species which interest us. This is not so difficult in some tropical fisheries, such as the Gulf of Thailand trawl fishery chosen by FAO to illustrate their point.

This fishery has grown from 20,000 to one million tonnes in 20 years and has now levelled off. The demersal catch contains some 200 species, and therefore provides a better overall picture of the biomass than the more specialised Atlantic fisheries. Fortunately, it has been well documented during the period and should therefore form the basis of a successful model.

Factors about which scientists are still learning, apparently, are those of the relationship between predators and prey and between competitive species. For example, the best way to preserve the sardine may be to fish the anchovy more heavily.

Work carried out in closed systems of lakes and ponds suggests that the tendency to concentrate fishing on the faster growing prey fishes will reduce the number of larger and perhaps more desirable predator fish. The time to harvest the prey therefore is when the number of predators has fallen off severely.

### Prejudice

One suggested method of conservation might be a total allowable biomass catch, so that any excessive fishing on one species would prejudice the catch of another, and so encourage maintaining natural balance. In areas such as Georges Bank far more restrictive and directed limitations on catch have now become necessary, but the idea remains attractive.

Another possibility is that of manipulating the system to maintain a balanced ecology. This has been done in ponds, and ways may be found to apply it on the grand scale.

Bearing in mind the many other variables and the need for swift reaction to stock changes, it is apparent that this is the area of the computer model and the statistician.

But on the catching and management side there must be a new realisation of the total biomass concept, and of the need for more and more, and better and better statistics to feed what shows signs of becoming a new science in its own right. And this must be a two-way communication, for management will have a right to expect instant warning of endangered stocks or vice versa. But science will have a right to instant reaction on the part of the catcher, which has not always been the case.

\*Some Scientific Problems of Multispecies Fisheries. FAO Fisheries Technical Paper No. 181. Report on the Expert Consultation on Management of Multispecies Fisheries. Rome, 20-23 September, 1977.

## Shared stocks and the EEZs

THE GENERAL adoption of the 200-mile EEZ suggests that the countries concerned expect it to solve at least some problems — mainly those of conservation or catch regulation. But the new regime has brought with it a new batch of problems.

In casting aside the old regime, we have lost much of the administrative network that has evolved with time. Their function is now being taken over by coastal states.

For largely self-contained fisheries such as those of Iceland and Faroe, this is not such a problem.

In the case of the EEC, the idea of totally shared stocks remains too indigestible a meal for the many meetings and committees attempting to agree a Common Fisheries Policy.

The role of FAO in the 200-mile era will be more directed in aiding states which have yet to set up the machinery of

regulation and enforcement. However, it seems that FAO anticipated the problems and has produced a useful document designed to assist member countries in assessing the impact of changes in jurisdiction on the management and utilisation of fishery resources.

The author is FAO consultant K. M. Brander of Lowestoft Laboratory, in England.

He considers how management can best be achieved

within the scope of the 200-mile regime, dealing with the special problem of stocks which migrate from one EEZ to another. How are stocks to be allocated and regulated? What will be the requirement and availability of statistics and scientific advice? What new regional bodies will have to be set up?

*The Effect of 200-mile Limits on Fisheries Management in the Northeast Atlantic.* FAO Technical Paper No. 183. From FAO Publications, Via della Terme di Caracalla, 00100, Rome.

## Recollections of life in the days of sail

BACK IN the days of sail, when an old fisherman died his life story usually died with him. Any papers he might have left were often destroyed by relatives ignorant of their historical value.

But one man, Edgar March, has probably done more than any other to collect and compile a record of a by-gone era of the British fishing industry. Now his book *Sailing Trawlers*, first published in 1953, has been reprinted by David & Charles Ltd.

During his lifetime, March managed to salvage a great deal of material — much of it first hand from old smacksmen who were alive at the time.

He writes of the design, building and development of the craft, how they were rigged and fitted-out, life aboard, and the duties of the various members of the crew.

He describes the North Sea fishery and the rise of such ports as Barking, Hull, Grimsby and Yarmouth, and how the spreading railway network fed the growth of the big trawler ports.

Mr. March also describes the coming of steam capstans and steam trawlers, methods of long-lining and beam trawling, how sails were made (and some sailmakers' secrets), and much else besides.

The last part of the book deals with the lesser-known fishing stations, and fully describes one representative smack, the *Master Hand*, which, motorised, was fishing out of Plymouth up to ten years ago.

Skipper J. T. Crouch of Lowestoft was in charge of her fitting-out at Rye in 1920, and later worked her. He knew the author and was able to give first-hand information.

The book is well printed and has a fine selection of photographs, drawings and plans.

At £12.50 (£10.50 if ordered before February 1979), it is good value for money.

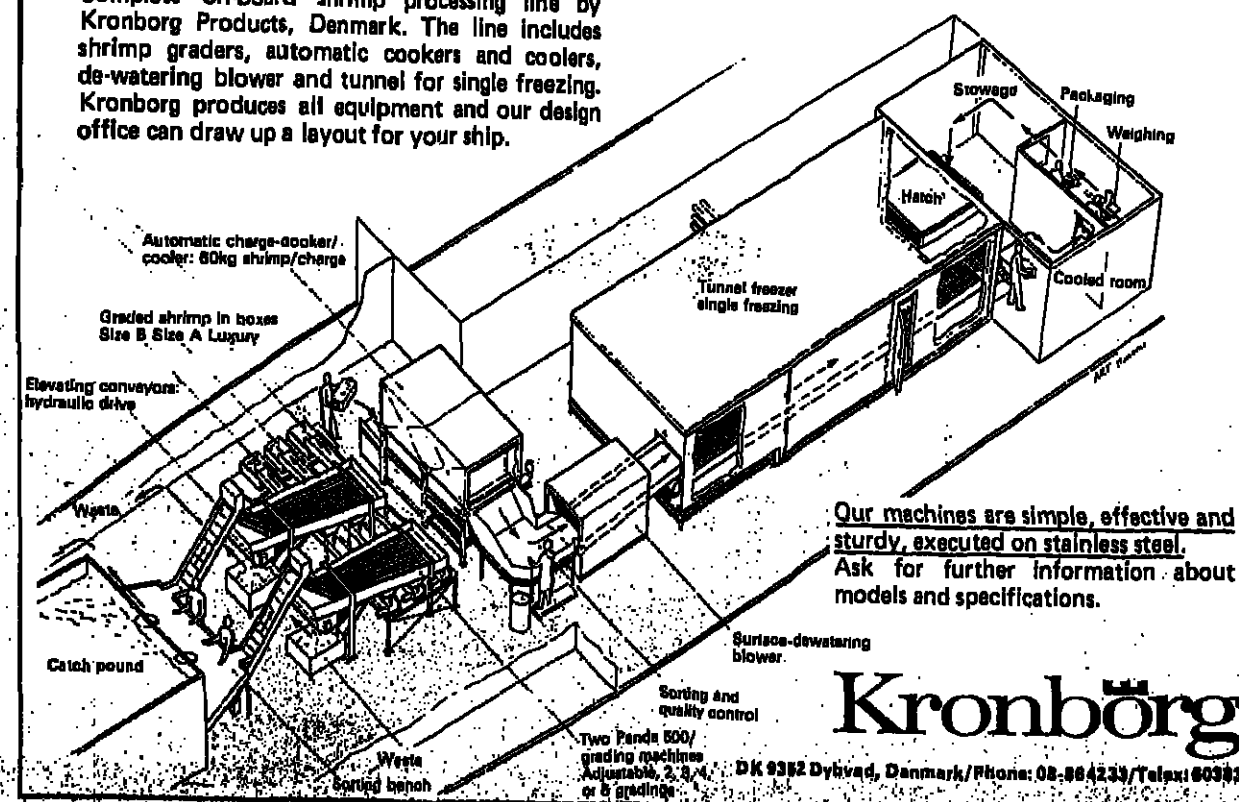
*Oil site guide*  
AN up-to-date edition of the booklet giving the positions of all sub-sea wellheads and permanent oil and gas installations in the North Sea has been produced by the Department of Agriculture and Fisheries for Scotland.

*Oil installations in the North Sea*, is designed to alert fishermen to aspects of the North Sea oil operations which may affect their work.

Pat O'Driscoll

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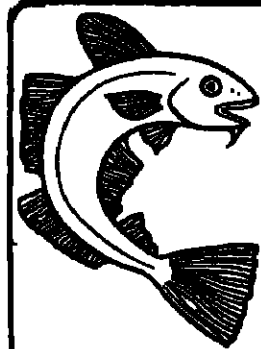
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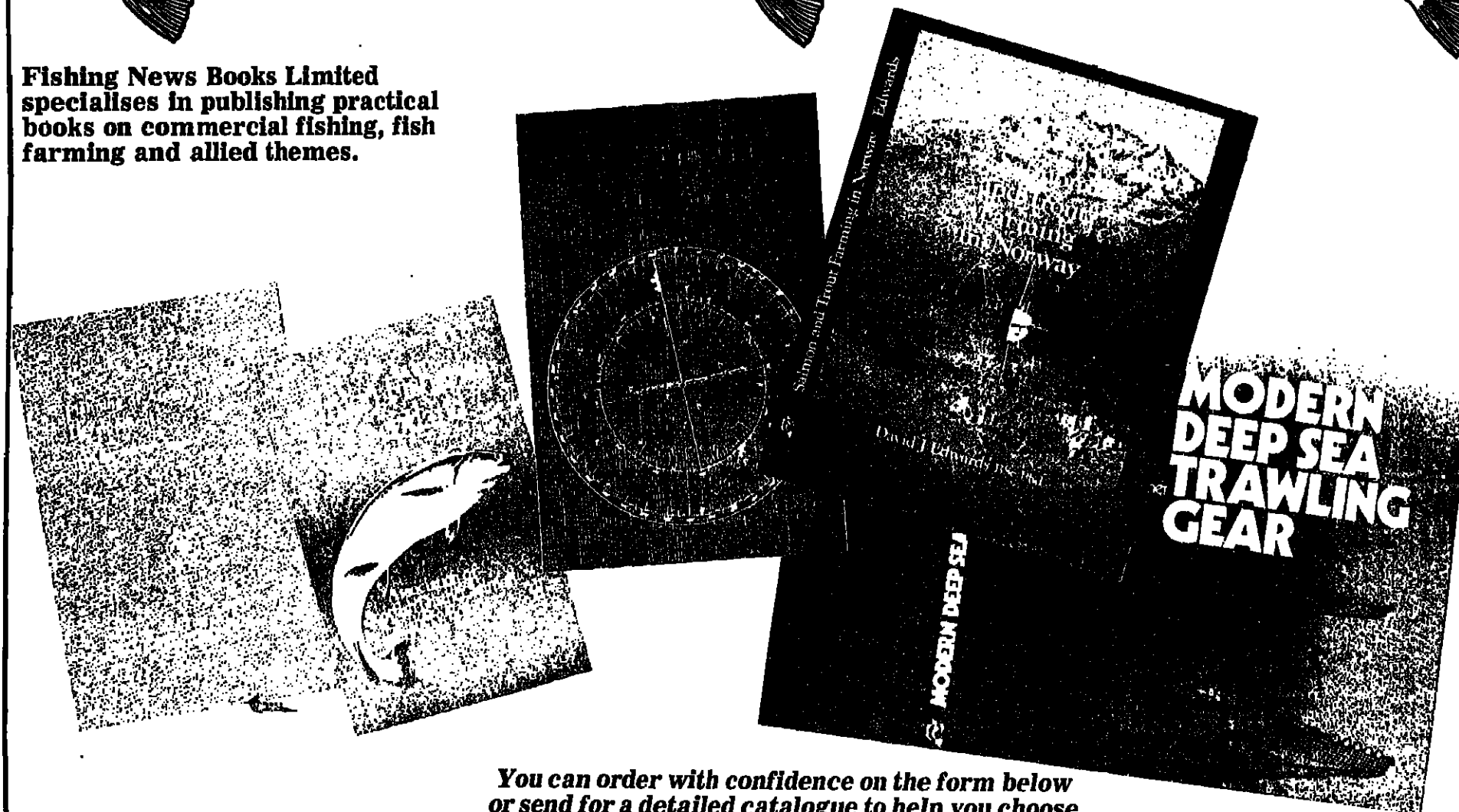
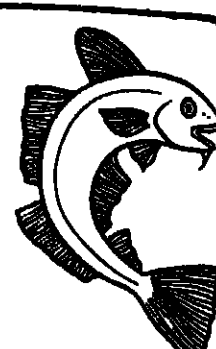


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## THE BOOKS PAGE

# BRITISH TEST TROPICAL PRAWN FARMING



Jumbo tiger prawn — promise for indoor culture.

BRITISH experiments on the indoor cultivation of tropical prawns have now reached the stage where the basic economics of farming may be considered on the basis of laboratory results.

This is the conclusion of a new leaflet by J. F. Wickens and T. V. Beard of the Fisheries Experiment Station in Conwy, Wales.

As the writers of this leaflet point out, there is a continuing high demand for shrimps and prawns on world markets. In 1976, for example, the catch amounted to 1.25 million tons of which half was consumed by only two countries, the United States and Canada.

The high value of these crustaceans has encouraged a sustained effort to devise ways of cultivating them.

It has been estimated that, over the past ten years, the potential for culture of some 46 species has been investigated in more than 40 countries, in addition to the traditional practices of India and the Far East.

## Incentive

There is considerable incentive therefore to find viable methods of prawn culture and the MAFF's station in Conwy has been active in the search since the mid-1960s.

It began with the European common prawn, the spot prawn from Canada and the giant freshwater prawn *Macrobrachium rosenbergii*.

Work on the freshwater prawn has continued and the station progressed with tests in culturing ten species of penaeid prawn.

Of the prawns tried out at Conwy, the jumbo tiger (*Penaeus monodon*) from the Philippines has emerged as the outstanding species.

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It was tolerant of handling, grew to market size (35 g) in six months and survived well, showing little of the cannibalistic tendencies of some of its relatives in crowded conditions.

Yields of about 1.4 kg/m<sup>2</sup> may be expected six months after stocking.

Experiments showed that prawns readily accepted compounded diets prepared in the form of dry pellets and that some formulations gave good growth and survival, although further work would be needed before an economical pellet could be formulated.

Laboratory Leaflet No. 42, Prawn Culture Research, is obtainable from the Fisheries Laboratory, Ministry of Agriculture, Fisheries and Food, Lowestoft, Suffolk, England.

## Fish pathology

WITH THE growth of aquaculture, fish pathology is fast developing into an essential industry discipline, with worldwide connections and recognised practitioners.

One of the best known of them is Dr. Ronald J. Roberts, of Stirling University, Scotland, and he has edited a valuable new book on the subject which includes the work of 12 contributors.

It brings together knowledge about the teleost fish from many fields, with all points considered within the context of husbandry and economics.

The 328 pages of *Fish Pathology* include eight pages of colour plates. The book is published by Baillière Tindall, 35 Red Lion Square, London WC1R 4SG. Price £21, plus 50p for postage.

# American example will help



Oyster farming on the US east coast — useful experience for other countries.

## all shellfish growers

IN *Practical Shellfish Farming*, Phil Schwind sets out to tell the reader as clearly as he can how to make money from growing shellfish.

But he does not oversimplify the ways in which oysters, clams and mussels can be grown. His approach, though practical, is realistic to the point where the reader can almost feel a sympathetic backache.

Phil Schwind's experience — or his terms of reference — are limited to the New England coast of the USA, with occasional reference to the laws governing sub-littoral culture in other American states. Nevertheless, there is a great deal of common ground, even in the legislation which governs and often inhibits this important industry.

Shellfish farmers from other temperate countries will find much to satisfy them here, and plenty of information on predator control, enclosures, raft versus bottom culture and harvesting techniques.

*Practical Shellfish Farming* by Phil Schwind, published by International Marine Publishing Co. Camden, Maine, USA.

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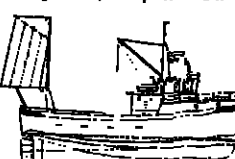
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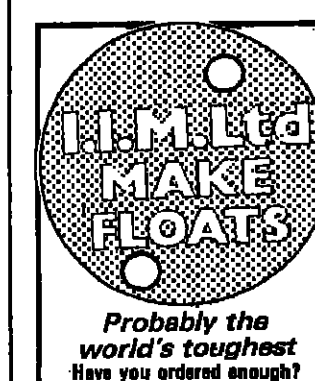
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